THE RAILWAY GAZETTE

A Journal of Management, Engineering and Operation

INCORPORATING

The Railway Engineer · TRANSPORT · The Railway News

The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.

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An index to the seventy-sixth volume of THE RAILWAY GAZETTE *covering the issues from January 2 to June 26, 1942, has been prepared, and is now available free of charge on application to the Publisher*

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE *in that the size of the page has been reduced from 9 in. × 12 in. to 8½ in. × 11½ in. The type area of the page remains the same, namely, 7 in. × 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

The Half-yearly Dividends

THIS month the main-line railway companies will announce the result of working under the revised control agreement for the first six months of the current year. Present expectations are that the Southern Railway Company will be the first to make known its figures and this will take place on Thursday, July 23. The G.W.R. and L.N.E.R. companies will probably make their announcements on the next day, but in the case of the L.M.S.R. the directors' statement is not expected until July 30. Because of the guaranteed aggregate rental arrangement for the duration of the war and at least a year afterwards, there is but little scope for change in the total dividends for which home railway investors may look. A year ago holders of G.W.R. consolidated ordinary stock received 1½ per cent. for the half year and 2½ per cent. after the end of the twelve months period. On L.M.S.R. 1923 preference stock a 2 per cent. interim and a similar final were forthcoming and the ordinary stock of that company received nothing last July, but 2 per cent. for the whole year. The L.M.S.R. first preference stockholders received 2 per cent. a year ago and a further 2 per cent. to make up their full rate for the year; the second preference holders were unremunerated last July but got 2⅜ per cent. for the whole year. The Southern 5 per cent. preferred ordinary holders received their full interest in two equal parts for 1941 and those with deferred stock 1¾ per cent. in a single payment after the close of the financial year. It is expected that payments very similar to these will be made by the directors for 1942, both for the first six months and for the total period. In Stock Exchange circles it has been tentatively suggested that interim dividends of about half the total payments for last year may be paid on L.M.S.R. ordinary, L.N.E.R. second preference, and Southern deferred stock, and also that the distribution for the year on L.N.E.R. second preference might perhaps be stepped up to the more convenient rate of 2½ per cent.

Serving Many Masters

One of the great difficulties in the present war, which beset both private individuals and commercial undertakings, is that irreconcilable demands are made by various Government offices, each of which pursues a course unrelated to the activities of another department. For example, the new Ministry of Fuel & Power has embarked upon the task of reducing fuel consumption and eliminating fuel waste, and has asked for the appointment of voluntary "wardens" in every establishment. Many prudent establishments long ago appointed such an officer, and his task has become increasingly difficult by reason of the requirements of other Government departments. Within our experience there are many cases of wasted lighting through offices being permanently blacked-out as a result of air-raid damage. In colder weather, also, "first aid" repairs of blast damage often proved inadequate to keep out the cold, and caused an excessive amount of heating to be used. The War Damage Commission often recommends complete restoration of relatively minor war damage, a course which naturally appeals to the sufferer from the imperfections of first-aid repairs after two winters of weathering. The execution of such complete restoration is subject to a licence from the Ministry of Works & Buildings unless it is so trivial as to be capable of inclusion in a total expenditure of £100 in one year. The Ministry of Works & Buildings, however, views the matter from an entirely different standpoint, and shows a marked disinclination to authorise re-glazing. Thus much effort can be wasted in preparing detailed estimates for work which would satisfy the War Damage Commission and materially assist economy in fuel consumption, but which proves unacceptable to the Ministry of Works & Buildings.

Sir Trevredyn Wynne

Sir Trevredyn Wynne, who died at Leatherhead on June 28, at the age of 88, had been engaged for the whole of his working life in the construction and administration of Indian railways, and had a wide experience of both State and company-managed systems. He will be chiefly remembered for his work in connection with the Bengal-Nagpur Railway—the latest to be built of the great company systems on the 5 ft. 6 in. gauge. When that company was formed in 1887 he was selected by the directors to be its first Agent and Chief Engineer. Under his energetic direction the work of construction progressed rapidly and the railway of 627 miles from Nagpur to Asansol was opened in 1891. When he left in 1905 to become a Member of the newly-constituted Railway Board of India the Bengal-Nagpur system had been expanded to 2,994 miles. As a Member, and later Chairman, of the Railway Board he consistently pursued a policy of new construction. He was recalled to England in 1914 as a Government Director of Indian Railways; he resigned that office in 1915 and joined the board of the Bengal-Nagpur Railway Com-

pany as Managing Director, and continued to retain that office on his appointment as Chairman in 1930. It is of interest to recall that Sir Trevredyn Wynne was the oldest survivor of the engineers trained at the Royal Indian Engineering College, which was established at Cooper's Hill in 1871 and closed in 1906. Further biographical details will be found at page 39.

Distinguishing First Class

It is satisfactory to note that for some time more trouble than before has been taken by railway staffs to ensure that first class accommodation is occupied by those who are entitled to use it. On many trains first class seating space has been so ruthlessly pared that it is no more than adequate to accommodate the passengers holding first class tickets, and the question of standing third class passengers being allowed to use first class seats does not therefore arise. Some long-distance trains today, indeed, present the inverted spectacle of first class passengers crowded out of first class compartments into vacant third class seats. Coaching stock is often so begrimed externally that the figures on the doors are not very legible. Another source of trouble is end-door composite corridor stock, where three of the compartments may be first and the remainder third. Unless there is a plain "first class" sign inside the compartment, or on the window of the door from the corridor, the third class passenger who fails to distinguish between the subtleties of furnishing and finish of the two classes has some excuse. Difficulty also arises in the case of open vestibuled stock, some of which conveys no internal indication that it is first class. The L.N.E.R. is to be commended for its practice of affixing a large white figure "1" to all exterior first class windows, the significance of which cannot be misunderstood.

Overseas Railway Traffics

From the returns available to June 27, 1942, the approximate figures of gross earnings of the British-owned railways in Argentina for the financial year just ended can be ascertained. It will be seen from the accompanying table that each of the four larger companies has increased its gross takings. For the corresponding 52 weeks of the previous year, the estimated increases in pesos were 4,010,000 on the Buenos Ayres & Pacific and 854,000 on the Buenos Ayres Western, whereas there were decreases of 3,994,000 pesos on the Buenos Ayres Great Southern and of 4,511,300 on the Central Argentine. The increases for the financial year just ended of 1,962,600 pesos on the Argentine North Eastern and of 2,387,100 pesos on the Entre Rios contrast with decreases of 533,500 and 1,230,600 respectively in the previous year.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
Buenos Ayres & Pacific* ...	52nd	1,035	– 550	75,816	– 583
Buenos Ayres Great Southern*	52nd	2,063	– 496	125,941	– 10,060
Buenos Ayres Western* ...	52nd	1,088	– 58	45,230	– 3,692
Central Argentine*	52nd	2,004	– 80	91,898	– 5,908
		£	£	£	£
Canadian Pacific	25th	963,600	122,800	22,791,600	4,005,400

* Traffic returns in thousands of pesos

Aggregate gross earnings of the Canadian Pacific Railway for the first five months of 1942 amounted to £19,957,600.

Sulphur and Phosphorus in Rails

A recent revision of the British Standard Specification for bull-head railway rails has relaxed the maximum permissible percentages of sulphur and phosphorus in rails to 0·07 per cent. in each case. This is described as a wartime concession to the manufacturers, because of the difficulty in present conditions of controlling the raw materials of which rail steel is made in such a way as to ensure the lower maxima previously called for. In effect the change almost restores the limits of the original B.S. rail specifications of 1909, which were 0·075 per cent. for phosphorus, and 0·080 per cent. for sulphur. It was after the last war that the widespread substitution of open-hearth basic for Bessemer rail steel production, with the control of sulphur and phosphorus so afforded, suggested the use of a much higher carbon content than previously, with a drastic limitation of sulphur and phosphorus to avoid any tendency to brittleness in the rails. With basic open-hearth steel the carbon content was therefore raised to between 0·55 and 0·65 per cent., sulphur was restricted to 0·05 per cent. and phosphorus to 0·04 per cent., and these figures were incorporated in the B.S. rail specification of 1922. The steel so produced failed to give the results desired, as it was hard rather than tough, chiefly due to the accompanying limitation of manganese to 0·80 per cent., and it was this fact which prompted the L.N.E.R. to change over in 1931 to the medium manganese rail, with 0·05 per cent. lower carbon limits, that has since also been standardised. A feature of this medium manganese change was a relaxation of the sulphur and phosphorus maxima to 0·06 per cent., now eased further to 0·07 per cent. It seems clear today that in the past the bogey of sulphur and phosphorus has been magnified out of all proportion to the risks invited by unduly high percentages of these elements; indeed, up to the present limit of 0·07 per cent. there is reason to believe that phosphorus may be helpful as a wear-resisting constituent.

Modern American Track

A feature of the accounts of American railways during the last decade has been the considerable reduction effected in their maintenance of way costs. To some extent this has been due to the reduction of rail replacements during the years of depression, but even now that relaying has resumed its normal frequency, to meet the tremendous increases in traffic that war conditions have brought about, this economy in matters affecting the track is still manifest. Maintenance of way expenses on the Pennsylvania in 1941, for example, totalled $67,466,477 as compared with $87,847,375 in 1929—a reduction of over $20,000,000. That this is not due to any reduction in the standard of maintenance, but rather to increased efficiency of method, is clear from a study of the article on p. 32 reviewing permanent way progress in North America during the past quarter of a century. It is, perhaps, in the perfection of mechanical appliances for every description of work on the track, both relaying and day-to-day maintenance, that the greatest progress has been made, and it is therefore in labour that the most considerable economies have been effected. As the article says, "the list of power tools now in use on American railways appears endless," and it is the development of the internal combustion engine that has been the chief factor in making this mechanisation possible. At the other end of the scale it is rail manufacture that has probably made the least progress; the short 39 ft. rail still persists as standard, due to rolling-mill limitations, and though controlled cooling is eliminating transverse fissures in new rail, there is as yet no diminution in the number of earlier rails removed from the track in consequence of this defect, numbering nearly 20,000 a year, and serious derailments are still taking place from this cause.

The Chances of Engineers on American Railways

On more than one occasion we have drawn attention to the many civil engineers who have risen to be chief executive officers on Indian and Colonial railways. That the soundness of the civil engineer's training adequately befits a man for the highest railway posts in America is also borne out by a recent address by Mr. C. E. Smith, Vice-President of the New York, New Haven & Hartford Railroad. He points out that of the 180,458 route-miles of line comprising the most important systems in the U.S.A., nearly 65,000 miles (or about 36 per cent.) have civil engineers as their chief executives. To quote Mr. Smith's own words: "The amazing feature of the showing of civil engineers in railroading is that much less than 35 per cent. of the personnel on the railways are civil engineers. While I have no statistics to support such an estimate, I would say that 5 per cent. would be a very generous estimate of the proportion of civil engineers in railroading, which indicates that their chances of getting to the top have been seven times the chances of all others." He also reveals that on 84 per cent. of the above total mileage the heads of the civil engineering departments are college graduates, and that on 20 per cent. of it engineers are in charge of the operating departments, and on 29 per cent. they are heads of other departments, as well, of course, as their own.

The Tri-Colour Hand Lamp

The white, red, and green hand signal lamp (with for certain purposes a fourth yellow indication added), has long been in general use in Great Britain. Many early signalling patents cover lamps of this kind. The simple rotary form, derived from the old dark lantern, has kept the field, but other types, in which the colours were changed by pressing buttons or triggers, were much used by some lines at one time. We are at a loss to understand why some countries have not adopted this simple and safe method of giving hand signals. In France, for example, men are seen carrying lamps showing white to the front and red and green to the sides, the light seen changing as they walk about or turn round, rendering both the giving and the interpreting of signals a matter of much care and some difficulty. In other countries loose glasses are slid into place in front of the lantern, while in America the hurricane style of lamp, showing a light all round, is used. This necessitates carrying more than one at times, fitted with different coloured globes, and standing one down while the right one is used, and even this one when used, can be seen in every direction. This arrangement appears to us to be not only inconvenient and to necessitate more lamps

being used than are really necessary, but also to be very confusing, as the signals must often be visible to men whom they do not concern.

Turning the Tables

On a number of occasions we have referred to the prevalence in the United States of accidents at level crossings. In the earlier days of American operating such casualties were due chiefly to collisions between trains at railway intersections on the level, which are very common in North America; today the undesired meetings are between trains and automobiles, and the cumulative damage to material—including not infrequent derailments of trains—and loss of time so caused in the course of a year are very great. Hitherto, if actions have been brought, it is usually the long-suffering railway which has been forced to foot the bill, both for its own damage and the damage to the road-user, but a judgment given on March 26 in the Federal Court at Tampa, Florida, shows that at last the worm has turned. A case was brought by the Seaboard Air Line Railway against a St. Petersburg firm owning a motor lorry which ran into the side of one of the S.A.L. 4,000 b.h.p. streamlined diesel units at Seminole crossing in Pinellas county. As a result, the owners of the lorry were ordered to pay the cost of repairing the locomotive, which amounted to $2,863, and at the same time they lost their suit against the railway for the death of the lorry driver. Even these damages do not compensate the railway for the delay caused by an accident of this kind, or for the non-availability of their locomotive while it is under repair, but the judgment is at least a step in the right direction.

De Glehn Compounds

Despite the use of three compound Atlantics on the Great Western Railway in the early part of this century, and the wide use of the system in France and other parts of Europe, there is often a good deal of doubt as to the details of the de Glehn principle of compounding. It provides for direct exhaust from the high-pressure cylinders to the atmosphere, and for the admission of high-pressure steam to the low-pressure cylinders. In a four-cylinder compound the arrangement of the change-over (direct exhaust) valve and the regulator valve (live steam to l.p. cylinders) can give five possible working combinations, namely, (*a*) compound—two h.p. cylinders exhausting into two l.p.; (*b*) compound, but with admission of some live steam to the l.p. cylinders in addition to the steam exhausted from the h.p. pair; (*c*) four-cylinder simple, the h.p. cylinders exhausting direct to the atmosphere and live steam being admitted to the l.p. pair; (*d*) two-cylinder simple, cutting out the l.p. cylinders entirely; and (*e*) two-cylinder simple cutting out the h.p. cylinders. The first case represents normal working, and the second is often used when working heavy trains uphill. The third principle is often used at starting but is rarely continued for more than a few hundred yards. Two-cylinder simple working, cutting out the l.p. cylinders, seems to be used very infrequently, and it and the fifth method appear to be of practical use principally if defects occur in either the h.p. or l.p. cylinders or their sets of mechanism.

The Eternal Triangle

A novel view of the railway position in the United States was given by Mr. Ernest E. Norris, President of the Southern Railway, in a recent address to the Bond Club of New York. The railways, their competitors, and the travelling public to his mind represented the eternal triangle of the movie story—the sturdy but inarticulate country lad and the flashy and boastful city youth both angling for the favour of the beautiful country girl, "the lovely abstraction that we call the public." In the process of growing up, the railways did not find time enough to acquire polish or education in the fine art of advertising: they were clumsy in their courting, and never seemed to find the right word at the right time. Now comes the fire which traps all three characters, and the sturdy country boy succeeds in saving both Miss Public and his rival. The beautiful lady is appropriately grateful and affectionate, as indeed she needs to be, seeing that "The railroads are turning in a 100 per cent. plus job of living up to their pledge made in November, 1940, to meet to the full the demands of commerce and the needs of national defence. Not a single shipper in the United States has been told that he cannot have all the rail service he asks for, when and where it may be needed." The *Wall Street Journal*, however, has discovered that the triangle is by way of being a quadrilateral. "The sturdy boy's problem," it comments editorially, "springs less from the competition for the young lady's favour than from the sometimes too overbearing threats of her kid brother and his constant demands for dimes and ice cream sodas." And the "kid brother," needless to say, is American labour.

The Ministry of Works Bottle-Neck

A CURIOUS situation has arisen as a result of the operation from January 1 last of Defence (General) Regulation 56A, which governs the control of civic building (including building maintenance) and limits the total annual expenditure on all such items for any single property to £100 unless a licence is obtained from the Ministry of Works & Buildings to expend a greater figure. The object of the Regulation is to secure economy in the use of labour and materials that are urgently required in the construction of building work vital to the prosecution of the war. It will be noticed that the basic sum of £100 is fixed arbitrarily and is not related to the size of the property—thus cottages and small houses may spend money on such works far in excess of reasonable requirements, whereas the largest commercial building is limited to the same figure of £100 unless its owners secure a licence. Of necessity, every owner of a commercial building of any size has applied for a licence, and at the beginning of this year we believe that most applicants received an interim licence for six months with reasonable promptitude. When that period was approaching expiry, it may be assumed that those responsible for the maintenance of office buildings and so forth applied for a further licence, and this is where the difficulty has arisen.

The licensing officer for the London Region was located until recently in Abell House, Westminster, but, just as the volume of work in connection with building maintenance licence applications was mounting rapidly, the office was changed to another building—this time in the City of London—with consequent dislocation of files, and without adequate public intimation. The need for paper economy has resulted in the discontinuance of formal acknowledgment of communications, so that the licence applicants are not even aware of the safe receipt of their documents. It would seem that, after a silence of four or five weeks on the part of the Ministry of Works & Buildings, many applicants are making personal calls, and then seeing something of the bottle-neck which is choking the progress of applications. It would appear that there are but few officers with authority to sign documents, or take decisions, even in comparatively small matters. The result is that some owners of commercial buildings are carrying on essential maintenance work illegally; and others are adhering to the letter of the law and suspending maintenance work to the detriment of the properties. We have nothing but sympathy for the responsible officers whose desks are choked with a volume of routine work that is unreasonable, but that sympathy is of no help to the applicant for a licence. Surely the basic figure might vary with the rateable value of the property, or at least many more officers might have been vested with authority to grant licences within agreed limits, leaving only the large and involved cases for the personal scrutiny of a senior officer of the Ministry of Works & Buildings.

Coal "Nationalisation"

THERE can be few industries more closely interrelated than those of railways and the coal trade. It was the needs of the coal trade which resulted in the invention of wagon-ways, railways, and steam locomotion, and the question of the national ownership of both industries is one of considerable antiquity. An important project for making the King "the sole merchant of the Coales" was presented to Charles I on July 10, 1628 (see Stowe MSS. 326, No. 1). The scheme proposed, *inter alia* :—

> (1) By makinge compitent passages for the waters, that anoye the mynors, or pyonors by makinge one Portable Ryver, from those parts, where the Coales are to be acquired ; by makinge Highwaies passable, and reformed Cariages, to convey the Coales to that Ryver. . . .

The proposal was for the Crown to take possession of all the coal mines within the Bishopric of Durham "Uppon remoove of that Bishop" and to develop these mines as a royal enterprise. The "reformed cariages" were doubtless to run on railed wagon-ways. It is scarcely necessary to say that this early suggestion of nationalisation was not proceeded with. During the intervening three centuries, many schemes of nationalisation have been advanced affecting separately the coal industry and transport, and, apart from the close relationships between these two, any step in the direction of national ownership of an important industry may be regarded as a straw giving an indication of modern tendencies.

The change, which took place on July 1, involved what has been widely termed (though not entirely accurately) as the nationalisation of the country's coal. This has been effected under the terms of Part I of the Coal Act of 1938, and all unworked coal in Great Britain has now become the property of the Coal Commission. Moreover, all the 9,000 odd leases under which colliery companies are now working have to be read as though the name of the Coal Commission were substituted for that of the original lessor. Proprietors who are working what was formerly their own coal must now secure leases from the Commission, and all other unworked

coal is the property of the Commission to deal with in such manner as it may think best for promoting the interests, efficiency, and better organisation of the coal mining industry. The Coal Commission is barred, however, from working coal itself, and so the step which has now come about is the nationalisation of royalties and not of the coal industry. Moreover, it is not technically nationalisation at all, as the Coal Commission is not a Government Department. It is a statutory public body which is required to be financially self-supporting, although the Minister of Fuel & Power (the successor to the President of the Board of Trade in matters relating to coal) may give the Coal Commission general directions on matters of national interest.

The Coal Commission was established on July 29, 1938, and has spent the intervening four years in the preliminaries of acquiring and administering the properties it has now taken over from the coal owners. The gross purchase price had been fixed by a special tribunal at £66,450,000, and this was embodied in the Act. Since that time it has been necessary for the Coal Commission to take steps towards securing the necessary information upon which the gross sum will ultimately be apportioned. The substitution of the Coal Commission for the private royalty owner will not lead to any immediate lightening of the burden of royalty payments, as the Commission may not for the present reduce any rent under any existing lease or accept anything but the best rent obtainable in granting new leases, but if, in due course, the operations of the Commission show a surplus, this is to be used for the benefit of the industry and not passed to the National Exchequer. The borrowing powers of the Commission are limited to £76,450,000, and its revenue depends on the output of coal. Thus, it will be seen that the change is of but indirect immediate interest to the main-line railway companies as transport undertakings, although the ultimate repercussions of such a step as has now been taken may be far reaching and drastic.

Relative Locomotive Efficiencies

OUR American contemporary, *Railway Electrical Engineer*, in one of its recent issues published an interesting short article by Mr. T. F. Perkinson, of the General Electric Company, in which the relative thermal efficiencies of steam and diesel-electric locomotives were considered. It was there stated that tests of steam locomotives of the reciprocating piston type show an overall thermal efficiency of approximately 6 to 7 per cent. for coal-fired engines in good condition and not including stand-by losses. Consideration of all-day efficiencies where coal consumed in maintaining and banking fires and keeping up steam is included, would undoubtedly lower the 6 to 7 per cent. figures in some degree, depending on the time that the locomotive was stationary in the course of a run, and that expended between trips. Oil-burning locomotives show somewhat better all-day efficiency than that of a coal-burning engine because of the better control of combustion conditions. The thermal efficiency of a steam shunting locomotive may run as low as 2 to 3 per cent., because of the poor load-factor obtaining in shunting service. Although the peak thermal efficiencies of the diesel-engine vary between 30 and 35 per cent. for locomotives used in traction work, the average for an engine in railway service approximates to 28 per cent.; in shunting service the all-day efficiency is somewhat less due to the low load-factor on the locomotive as a whole, and the consequent relatively large engine-idling time involved.

The author also gave some attention to electric locomotives, the thermal efficiency of which might, he said, be taken as 26·2 per cent. × 78 per cent. × 83 per cent. = 17 per cent. as a top approximation. It is true that considerable misunderstanding exists concerning the use of the terms "efficiency" and "economy," but the terms are sometimes used synonymously but incorrectly. One system may be more efficient than another, but less economical when applied to a particular traffic movement problem. This is the case when comparing a straight electric system with steam motive power on lines where the traffic densities are insufficient to justify the additional first costs required for the electric conversion and distribution systems. The same relations hold good where traffic densities or other local requirements are severe enough to justify economically the use of straight electric in preference to diesel-electric motive power; in such cases the lower first cost of the electric system in addition to lower operating costs, due chiefly to reduced locomotive maintenance, offsets any superiority in thermal efficiency represented by lower fuel costs that may be claimed by the diesel-electric locomotive. In some cases the more efficient system may also be the more economical, and this is particularly true when diesel-electric motive power is compared with straight-electric motive power in relatively light service.

The Pullman 1941 Report

VARIOUS exceptional features characterise the 15th annual report of Pullman Incorporated, the American company which both owns and works luxury rolling stock on an extensive scale over the majority of the railway systems in the United States, and is also one of the largest builders of railway rolling stock. The chief financial details were given in our June 5 issue. Since 1937 the number of cars owned has dropped from 7,763 to 7,048, but the number operated only from 5,500 to 5,303; car-miles have increased, however, from 872,598,392 to 878,057,274 in the year (an increase of over 50,000,000 from 1940). The average mileage a car a day has gone up from 435 to 454, and the average length of passenger journey from 517 to 596 miles, between 1937 and 1941 inclusive. But the average of annual expenses a car, which between 1937 and 1940 only rose from $10,886 to $11,603, took a sharp upward turn to $12,315 in 1941; at the same time the gross operating revenue a car, which rose from $11,689 to $12,053 from 1937 to 1940, only reached $12,642 in 1941. As a result, the net operating income a car a day, which in 1938 was no more than $2.20, was in 1941 down to $0.90, and the net operating income a passenger a day had shrunk from $0.25 in 1938 to $0.10 in 1941—a negligible return for all the effort it represented on the part of the company.

The situation has been saved, however, by the prosperity of the manufacturing side of the organisation. The number of cars ordered by the railways was slightly greater than in 1940, though still less than one quarter of the average annual purchases of such equipment before the depression of 1932; the orders for freight stock were larger than in any year since 1924; and, since war was declared, contracts or commitments for armament production have more than quadrupled. Of particular railway interest in the report is the note that the carrier subsidiary of the company has sold to the railways all the parlour cars that were surplus to normal requirements, for conversion into emergency coach equipment for the conveyance of troops and munition workers; the Pullman Company itself has also reconditioned a considerable number of retired sleeping cars, and with other cars withdrawn from the active list has collected a pool of about 1,500 sleepers assigned exclusively to troop transport.

Publications Received

Tool Tipping and Hard Facing.—A recently published booklet, entitled "Hard Facing with Murex Electrodes," illustrates the scope and value of the electric arc process of depositing layers of hard metal on machine parts to make them resistant to wear and abrasion, and also in certain other cases to provide cutting edges. Considerable economies can frequently be expected and experience has shown that in some applications the reconditioned parts can withstand service conditions better than the original parts.

The booklet, issued by Murex Welding Processes Limited, gives examples of a dozen typical applications of hard facing to engineering tools and other materials; it also gives details of the degree of hardness which can be expected from deposits of different Murex electrodes; and some classification of the electrodes according to the type of work for which they are suitable. These types range from lightly alloyed electrodes used for reinforcing medium carbon steels and railway tracks, to austenitic alloy electrodes used for building up lips of dredger buckets and manganese rail crossings; and also electrodes suitable for giving weld metal of about 600 Brinell hardness.

High Speed Diesel or Compression-Ignition Oil Engines. By A. H. Goldingham. London: E. & F. N. Spon Limited, 57, Haymarket, S.W.1. 8¾ in. × 5½ in. 171 pp. Illustrated. Price 15s. net.—The author of this book is already well known for other authoritative works on diesel, gas, and oil engines generally. The present volume gives a broad account of the subject of diesel engines and their applications to various purposes, with descriptions of some typical cases of their use in railway and marine service. There is a good choice of illustrations, difficult to make with the great variety of equipment already in use in different parts of the world; the salient features of the selected designs are pointed out. The line drawings are clearly executed. The introductory historical survey is of considerable interest, and aids much in following the rest of the work; the section on fuel injection enables the reader to obtain a clear understanding of first principles. The final chapter on torsional vibration, contributed specially by Mr. J. Bibby, M.Sc., is an excellent analysis, within a moderate compass, of a problem of fundamental importance in diesel engine design, insufficient attention to which can bring failure to otherwise well-planned equipments. The book should be very useful to those desirous of understanding the principal facts involved in the working and application of diesel machinery, especially if they have not time for a detailed study of what is now one of the most extensive fields of mechanical engineering.

The Scrap Heap

When They Shut Underground for Church Service

The days when Underground booking clerks shut the office for an hour and a half "church interval" on Sunday mornings are recalled by the retirement after 48 years of Mr. H. Jackman, Booking Clerk at Shepherds Bush (Hammersmith & City Line). Those "good old days" were bad old days if the hours then worked are any criterion. Mr. Jackman says they were really "austerity" days. He used to be up at 3.30 a.m. to get to Farringdon Street and open the parcels office by five. On alternate weeks his duties were from 2 p.m. to 1 a.m. the next morning. Before becoming a booking clerk (his job for 37 years) he worked seven days a week; his Sunday hours were from 7 a.m. to midnight.—*From the "Evening Standard."*

* * *

A passenger, who had apparently been running, arrived out of breath at an Irish station, to see the tail of his train disappearing from the platform.

"Do you mean to say she's on time?" he demanded of the stationmaster.

"She is that," was the reply. "She's the punctuallest train in the counthry, and she's the cause of great inconvenience to the public."—*From "The Best Railway Stories."*

* * *

Royal Travel on the G.W.R.

The Railway was by now the well-established mode of travel between London and Windsor, and popular at the Palace for the longest journeys as well; and the directors' delight was tinged with but little surprise when they were honoured with commands for two special journeys on March 7 and 10, 1863. The first was to enable the 21-years-old Prince of Wales (afterwards Edward VII) to meet at Gravesend the ship which was bringing him his bride-to-be, Princess Alexandra of Denmark, the "Sea King's Daughter" of the famous poem of welcome, and take her to his home at Windsor. The second, three days later, was to take the newly-wed Royal pair away on their honeymoon.

When the conversion from broad to narrow gauge was put in hand during the early seventies, the directors resolved to build yet another Royal Saloon, suited to the 4 ft. 8½ in. track which was to become standard throughout the country. This vehicle, completed in 1874, was 43 ft. long, 8 ft. 10 in. wide, and 7 ft. 9 in. high. It was the first narrow-gauge vehicle to be mounted on an 8-wheel undercarriage. Once the Queen had tried her newest Saloon she liked it so much that she decided to use it on all her future journeys between Paddington and Windsor, instead of travelling on the broad gauge.

As the years hurried by, and brought the Queen into her sixties, even these shorter journeys became a little trying for her on account of rheumatism. A Royal Train guard, who made his first trip in 1881 in charge of the Queen's Special, has recorded in his published memoirs that she had difficulty in stepping up into the Saloon. A footstool therefore was placed as an improvised means of shortening the step, and for future journeys an inclined way covered with green baize was contrived to ease Her Majesty's progress. The guard mentions that the most imposing figure in the assemblage was the Queen's Highland servant, John Brown, whose devoted attention to his Royal Mistress, once witnessed, was ever to be remembered. Even on this and subsequent occasions, after travelling had started to become increasingly a care rather than a pleasure, the Queen still remembered to commend the staff on "the smoothness of the journey."

* * *

Perambulators by Auction

Perambulators are very scarce in London, partly because of the hundreds destroyed in the German raids and largely because their manufacture is now severely restricted. Recently South London mothers thought they saw their chance at last to get them at reasonable prices as many were in the catalogue at the sale of lost property by the Southern Railway at Lambeth. The mothers, however, did not even get a chance to bid, as the perambulators and push-chairs were sold in large lots; 22 perambulators and 20 chairs were sold in one lot to a dealer for £48, an average of about 23s. each. The women tried to induce the purchaser to sell some of the vehicles separately, but he said that he was only the agent for a syndicate and he could not split up the lot. A railway official explained that some of the perambulators were damaged, so they thought it best to sell them in one lot. There was much indignation among the mothers, and the result is that the Central Price Regulation Committee has decided to suspend auction sales of perambulators for the present. To have ordered that these machines should only be sold singly or in pairs would have pleased the mothers better.—*From "The Manchester Guardian."*

"It was in the 'Pithy Suggestions' box addressed to the Manager."

Reproduced by permission of the proprietors of "Punch"

Amongst all that has been written on the subject of railway loudspeaker announcements, surely some mention is deserved of Westminster, that station which lies at the heart of the Empire and has the distinction of serving the Mother of Parliaments. Its time-honoured name is announced in accents which might lead one to imagine that the most golden-voiced of our politicians had been asked to make the record, for record presumably it is. A different, and rather querulous, voice announces that the latest arrival is, for instance, an "Ealing train," in a manner which almost suggests that it expects to be contradicted. Apparently only westbound trains have the honour to be described; the loudspeaker seems to preserve a discreet silence as to the destinations of those which proceed eastwards, towards, perhaps, less select districts than Ealing or Wimbledon, and which, therefore, are best left to go their way unsung!

* * *

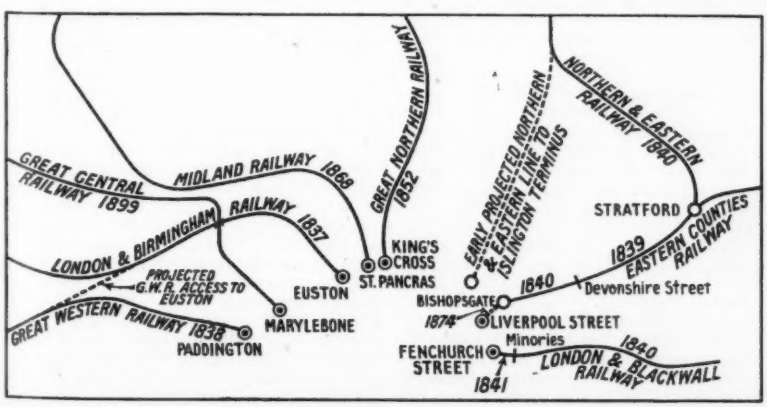
The Longest Ticket on Record

What is probably the longest railway ticket ever sold, was bought recently in Philadelphia by a prospective traveller. The purchaser, named Jacob Mitnick, who is a clothing inspector for the Quartermaster Department in the U.S.A., intended to use it on a round business journey of about 10,000 miles, visiting 82 cities in all, which was to take him over 18 different railways and to occupy six months. For accounting purposes, in North America, a separate coupon is issued for every section of the journey over the lines of the different companies, and the lines of their subsidiaries and these are joined together and folded into a ticket case. The number of coupons required in this instance made a total length of 14 ft., and cost Mr. Mitnick, $25.72 a foot, or $360.00 in all.

* * *

Caterpillar Wheels Needed?

A train proceeding from Sofia to Varna is said recently to have been stopped for five hours by a large number of caterpillars on the line.



London's northern railway termini—dates of opening

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

NEW ZEALAND

Completion of Westport-Inangahua Line

The completion last December of the Westport-Inangahua line, construction of which was reported in our November 7, 1941, issue to be practically finished, will provide much-needed communication between the Buller coal-producing district and industrial centres inland. Formerly there was no through rail communication between Westport and the rest of the South Island, and coal had to be shipped to distribution points elsewhere.

CANADA

Canadian National Railways

The report for the first four months of 1942, issued on May 20 by the Canadian National Railways, shows that net revenues were higher than in any previous corresponding period, but that the net gain in April was considerably smaller than in any of the first three months of this year. Gross revenues for April showed an increase of $3,667,101 over the same month of 1941, but there was an increase in operating expenses of $3,388,364; so that only $278,737 was carried into net revenue. The gain in net revenue for March was nearly $1,500,000, over $1,000,000 in February, and over $2,000,000 in January. With the exception of last November and December, the April gain is smaller than any shown in 1941 (December, 1941, showed a decrease). The following table shows the net earnings, and the change from the preceding year, for each month since January, 1941 :—

1941	Net earnings		Inc. or dec.
	$		$
January	3,150,394	+	1,478,598
February	2,609,117	+	845,929
March	4,932,055	+	2,929,078
April	6,799,362	+	5,110,381
May	7,788,841	+	4,276,907
June	6,828,443	+	1,267,236
July	4,916,312	+	743,726
August	5,171,732	+	1,503,551
September ...	6,393,072	+	2,465,605
October	6,038,729	+	797,407
November ...	5,719,836	+	195,612
December	6,260,450	−	13,100
1942			
January	5,157,112	+	2,006,718
February	3,644,440	+	1,035,323
March	6,423,606	+	1,491,552
April	7,078,100	+	278,737

UNITED STATES

The C. & N.W.R. 1942 Programme

It is estimated that the Chicago & North-Western Railway will spend during 1942 approximately $46,000,000 on modernisation work. Of this total $18,000,000 is being expended on track and structures, including the relaying of 100 miles of main lines with 112-lb. rails, on laying heavier rails at many points in secondary lines and sidings, and on 300 miles of reballasting. There are also to be new electrically-operated gates, wigwag and flashing signals at various points, and power frames to replace several mechanical signal installations. On the maintenance and improvement of equipment, the estimated expenditure is $17,600,000. Improvements in motive power include the installation of mechanical stokers on 50 locomotives, and of power reversing gear on over 100, together with other developments. New rolling stock accounts for $10,275,000, and includes 20 diesel-electric shunting locomotives and 3,375 freight wagons.

A Solicited Suburban Service

Many American railways which are concerned almost exclusively with the conveyance of freight or minerals run no more than a "token" passenger service of one passenger train each way daily, calling at all stations, over their main lines. The Virginian, an important electrically-operated coal-carrying line, comes within this category. On its way to tidewater at Sewall's Point, where the coal is shipped, the Virginian main line circles the city limits of Norfolk, Va., tapping various residential areas in its course, and it is felt that a considerable proportion of the season ticket traffic between these suburbs and the naval operating base adjacent to Sewall's Point could be handled by this company, thereby relieving city congestion. A proposal for a passenger service for this purpose is being put to the railway by the Norfolk Association of Commerce; the service would affect South Norfolk, Campostella, Chesterfield Heights, Fairmount Park, Estabrook, and other suburbs.

Testing Pendulum Cars

On April 1 a test run was made over the lines of the Great Northern Railway, between St. Paul and Duluth, with three of the new pendulum-suspended cars which have been built for that company, and for the Chicago, Burlington & Quincy, and Chicago, Milwaukee, St. Paul & Pacific Railroads. A train was made up to include both these cars and ordinary standard stock, for purposes of direct comparison as to relative smoothness of riding, and speeds of up to 85 m.p.h. were run. Similar test runs are being arranged, to take place over various other main lines.

Reconditioning the "Katy Lines"

On April 10 the chairman of directors of the Missouri-Kansas-Texas Railroad, or "Katy Lines" as the company is generally known by phonetic derivation from the initials M-K-T., announced to the stockholders that the board had been authorised by the Interstate Commerce Commission to put in hand work which would result in a "completely reconstructed" railroad. This includes the laying of new rails on 150 miles of track, heavy ballasting and resurfacing of several hundred miles of track, and extensive reconstruction of rolling stock, for which additional shop personnel will be needed.

Slowing-down of Railway Abandonment

Examiner Jerome K. Lyle has recommended to the Interstate Commerce Commission that the petition of the Union Pacific Railroad for abandonment of the entire 111½ miles of its subsidiary, the Laramie, North Park & Western RR., from Laramie, Wyoming, to Coalmont, Colorado, should not be granted. The railway was operated at a loss for some years before its acquisition by the Union Pacific, which was acquainted fully with the facts, and the latter obtained permission to purchase because of the prospective value of the L.N.P. & W. as a feeder line. Although full expectations in this respect have not been realised, the net operating income of the subsidiary has remained practically unchanged for eleven years, so that the Union Pacific is in no worse a position than before, and, due to petrol and rubber restrictions, the line is now more needed than ever. On the other hand, a recent unusual application to the Interstate Commerce Commission, amid many requests for authority to close down, has been one by the Great Northern Railway for resumption of operation from Kalispell, Montana, to Marion, a distance of 23 miles, and to Somers, a distance of 9¾ miles; both these branches were abandoned some time ago.

Illinois Central Employees Buy War Bonds

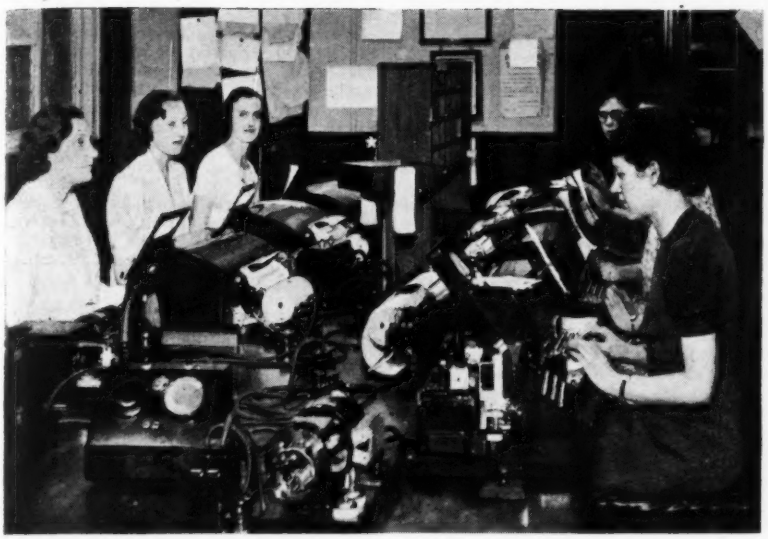
A general committee, consisting of 24 representatives of organised employees and management, has organised a campaign to encourage the sale of war bonds among Illinois Central Railroad employees. Incomplete reports for the first four weeks of the campaign indicated that 16,700 employees either had made cash purchases amounting to approximately $911,000, or had authorised payroll deductions representing about $164,500 monthly. Before the organised campaign started, employees had made cash purchases totalling about $754,000, and had authorised $36,000 as deductions from wages.

ARGENTINA

Re-organisation of Transport in Buenos Aires

A scheme for the re-organisation of the transport system of Buenos Aires has been submitted by the transport corporation to the control board. The scheme embraces 50 tramway, 35 bus, 83 *colectivo* (micro-bus) and 5 underground routes, and will involve the suppression of some 70 miles of tramway lines. Its most notable feature is the proposed revision of the scale of tariffs, which will be classified as (1) the economic system; (2) the semi-economic system; and (3) the special system. The economic system will apply to the 5 underground lines, fed by 50 tramway, 12 bus, and 41 *colectivo* services. There will be special cheap tickets for workmen at the rate of 7½ cents single (15 cents return), available during certain hours as at present. At other times, and for the general public, combination tickets between the surface and underground routes will be issued at the rate of 20 cents for any distance. It is estimated that about 70 per cent. of the travelling public will elect to use this system. The semi-economic system will comprise 23 bus and 3 *colectivo* routes, linking up the principal commercial centres. Where these services connect with the underground routes, the 20 cents combination fare, established for the economic system, will be applicable. The fares charged on this route will be the same as those in force on the economic route within the central district; but a supplementary charge of 5 cents will be made on passing outside the central district, and for each subsequent district, so that the minimum charge for two districts will be 15 cents. The special system will comprise 39 routes over the principal thoroughfares and suburban arteries, which will be provided with an express service of the fastest and most up-to-date vehicles of the *colectivo* type, connecting the centre of the city and the outlying suburbs. On these routes the minimum charge will be 20 cents, and the maximum 30 cents; this eliminates the existing maximum fare of 40 cents charged for the more distant services. No combination tickets will be issued for these services.

Teleprinter Network of the L.N.E.R.



Teleprinter table, showing reperforator (front left), automatic sender and dial-box (front centre), perforator (front right), and local teleprinter at rear

ALTHOUGH rapid communication between various railway departments can be obtained by telephone, it is often desirable to transmit and receive messages in a manner which allows of ready back reference, and the teleprinter best meets this requirement. The L.N.E.R. introduced teleprinters to the British railways, with experiments between York and Newcastle, which led, in 1926, to the provision of a circuit linking London, Cambridge, and Norwich, and, in 1928, to the installation of a comprehensive system in the North Eastern Area of the L.N.E.R. York was made the focal point, whence extended lines to King's Cross, Derby, Sheffield, Leeds, Doncaster, Darlington, Hull, Middlesbrough, Sunderland, Newcastle, and Edinburgh.

The successful results obtained with this installation have led to the provision of similar equipment in the Southern Area of the L.N.E.R., and the automatic switching teleprinter network which was installed just before the war is the first in the world to incorporate manual supervision facilities. Automatic teleprinter inter-connection is provided between the principal Southern Area stations, train-control offices, and headquarters. The working combines telegraph and automatic telephone practice, in that connection is by means of teleprinters, and the automatic switching is by standard telephone selector switches, relays, and dials. In fact, the system may be likened to an automatic telephone exchange, except that teleprinters are substituted for telephones.

The automatic teleprinter exchange is situated at Liverpool Street and the outstations are connected to it by ordinary telegraph lines. Thirty-six extensions are connected at present, of which 25 are outstation extensions, and 11 are local Liverpool Street extensions, comprising eight teleprinters, two reperforators, and one automatic sender. These eleven instruments handle the local Liverpool Street transmission and supervisory traffic. The reperforator converts incoming messages to the actual electrical code comprising the received characters, represented by perforations on a paper tape. The tape is fed at convenient periods into the automatic sender, which decodes the perforations into the original electrical impulses and transmits the messages at a constant maximum speed of 66 words a minute.

Railway telegraph traffic consists of miscellaneous messages which have to be segregated according to their importance; for example, "danger" messages must take precedence over all other traffic. A purely automatic system would not cater fully for these conditions, and there must be some central method of manual supervision; accordingly the supervisory and test positions were fixed at the L.N.E.R. Liverpool Street telegraph office, the former enabling the supervisor to enter any extension, whether engaged or not, for the purpose of offering urgent messages (trunk offering), and also to perform general supervision duties. The supervisory position is, of course, the hub of the network, and the visual indication of the network conditions it provides, together with the facilities already mentioned, enables the supervisor efficiently to direct the traffic of the whole system. The test position incorporates a device, known as a stroboscope, for testing the teleprinter mechanism, a synchroscope for determining accurately machine speeds, and a dial-speed tester. Facilities are provided for testing the extension lines. Each outstation is equipped with the following apparatus:—

(1) Teleprinter;

(2) Dialling unit fitted with commercial-type dial, key for releasing the connection at termination of transmission, and a red and green lamp to indicate whether the call is incoming or outgoing;

(3) Apparatus cabinet, containing the transmission and switching relays; and

(4) Rectifier for supplying the correct transmission and switching electrical supplies.

Direct access between two stations is obtained by dialling the number of the station required. The switching-together of the appropriate lines is performed automatically by the selector switches in the Liverpool Street exchange. Immediately the connection has been established, the telegraph code of the station required is automatically generated by the receiving teleprinter and printed back on the calling instrument, indicating that the correct connection has been made and that communication may commence. At the conclusion of the messages, either party may release by pressing the release key on the dial-box. Had the station called been engaged, the word "busy" would have been printed back automatically on the calling station's teleprinter, Thus, if Sheffield dials Norwich, whose number is 57, if the connection is established, the telegraph code of Norwich —TP—is printed back on the Sheffield teleprinter; if, on the other hand, Norwich is engaged when Sheffield dials, the word "busy" is printed on the Sheffield instrument, and the latter is then free to dial any other station. In order to obtain the supervisor, an outstation operator presses the appropriate key (OPK) on his dial-box, and visual and audible warning is then given to the supervisor, who enters the extension and ascertains requirements. The supervisor may be obtained even if the outstation is already engaged, and may call any other station by throwing an appropriate key; dialling is not necessary.

If difficulty is experienced in obtaining stations by direct dialling during busy periods, two methods are available for dealing with the less urgent traffic which ordinarily accumulates; either by the reperforator and automatic sender, already mentioned, or by manipulation of the supervisory equipment, to "camp" any station requiring an engaged station on to the latter's circuit, in such a way that the calling station is automatically switched through to the engaged station immediately the latter is free.

The telex sender is similar to, and performs the same functions as, the ringing machine used in telephony for providing the "engaged" and "ring" tones. It is not possible, of course, to receive similar tones on the teleprinter, and the telex sender is so constructed that the actual words are generated for reception on the teleprinters, *i.e.*, "Busy," "Unob" (Unobtainable), "Perf" (Reperforator), together with the control signals for starting a called teleprinter and releasing connections.

FURTHER ELECTRIFICATION IN HOLLAND.—An additional 34 km. (21 miles) have been added to the electrified route mileage of the Netherlands Railways by the opening to electric traction on May 4 (with the introduction of the summer timetable) on the sections from Utrecht to Amersfoort and from Utrecht to Hilversum. Both are of standard gauge and double track. Stopping trains now cover the Amersfoort line in 24 min., against 38 min. by the steam-worked trains. On the Hilversum line the journey now takes 18 min., compared with 25 min. previously. On May 4, also the first three of the new five-car units (plans of which were published in our Electric Railway Traction Supplement of March 1, 1940), were placed in service; the first of these units was completed before the German invasion in May, 1940. It is stated that the remaining 22 units, as well as the 15 two-car sets and 66 trailers of the same order, are nearing completion and will be introduced into service during the current timetable.

Permanent-Way Progress in North America *

Twenty-five years of development in maintenance and construction methods for way and works on the railways of North America

AS providers of transport American railways have passed through twenty-five eventful years with varying fortune not unlike their British counterparts, but the fluctuations in traffic due to trade booms and depressions, competition, and the struggle for ever-growing efficiency perhaps have been more marked. The general tendency in America has been to close unprofitable secondary lines, to reduce the amount of rolling stock while increasing the capacity of individual units, and to operate those units far more intensively by cutting down the time required for loading, unloading, and standing by as well as travelling time. The problem for the way and works department has thus been to provide for heavier loads and higher speeds concurrently with a substantial reduction in expenditure. Load development in 23 years is seen in the following table:—

	1916	1939*
Miles of line	254,251	235,000
Passenger train cars	52,179	38,427
Freight wagons	2,253,233	1,671,712
Freight wagons — average capacity, tons	40·6	49·7
Freight trains — average weight, tons	590	825
Locomotive—average tractive power, lb.	32,721	50,395
Locomotive, passenger — average miles operated daily	110·1†	184·3
Locomotive, freight—average miles operated daily ...	85	104
Normal maximum run without change of engine, miles	100	800

* Latest date for which statistics available. † 1920, when information first available.

So far as speeds are concerned, in 1916 the fastest passenger trains averaged between 40 and 50 m.p.h. and only a few important freight trains averaged more than 10 m.p.h. By 1940 many of these passenger trains averaged between 60 and 70 m.p.h. Trains totalling over 75,000 train miles a day are now given booked timings requiring a cruising speed of 75 to 90 m.p.h. with top speeds of 110 m.p.h.; freight trains are now approaching and indeed exceeding passenger train speeds of but a few years ago.

In 1916 there were practically no rails heavier than 100-lb. per yd., and 90-lb. was standard on many lines; about that date three railways introduced 127, 130 and 137-lb. rails respectively for heavy traffic and by 1930 the Pennsylvania, which had laid 130-lb. rails throughout the 8,742 track miles of its main lines, had advanced still further to a 152 lb. per yd. section. The new standard 112 and 131-lb. rails became available in 1933, when in spite of the very grave trade depression these rails were laid extensively. The introduction of these rails preceded the speeding up of traffic and is considered one of the important factors in improving the track and enabling it more than to meet the heavy demands of the present day. The serious derailment of a passenger train in 1911 caused by the failure of a rail which had a hidden transverse fissure gave rise to attempts to find a means of detecting these fissures in open-hearth rails before actual failure occurred. This problem was solved by Elmer A. Sperry, the inventor of the detector car; equally important is the discovery that the defect can be eliminated by controlled cooling of the rails after rolling. Nevertheless the problem of the fissured rail is still extremely serious, and although nearly 20,000 fissured rails are being taken out of the track annually, roughly two-thirds of which are detected, and the remainder fail in service, bad derailments from this cause continue to occur.

The perfection of welding methods, both oxy-acetylene and electric, for building up or reconditioning worn switches and crossings, and the butt welding of rails, have been important developments. With this is allied the heat-treatment of rail ends and the improvement in grinding methods for reshaping switches and crossings and rail ends after welding. It is interesting to note that lighter rails have been found incapable of standing up to the high speeds now run; on tracks carrying fast traffic the old 90 and 100-lb. rails, which would otherwise have been kept in service many more years under the slower speed conditions, have had to be removed.

Permanent Way Materials

The greater depth of the new 112 and 131-lb. rail sections, in addition to making the rails much stiffer as beams, allows deeper fishplates to be used. Intensive research by railways and manufacturers has evolved fishplates which may be claimed to be nearer perfection than ever before and adequate for present requirements. Joints have been improved further by the adoption of heat-treated fishbolts. The use of these bolts disclosed the fact that lockwashers of ordinary carbon steel were inadequate; field and laboratory tests have resulted in the use of alloy-steel spring washers having high reactive values capable of maintaining proper tension in the fishbolts. Since 1916 creosoting of sleepers has become almost universal, and has given them a life of some 20 years against five or six years without treatment. The size of sleepers 25 years ago was generally 8 ft. × 8 in. × 6 in.; as loads increased the size has risen to 8 ft. 6 in. × 9 in. × 7 in., and in 1940 one railway had increased the sleeper length to 9 ft. on its main line between Chicago and Los Angeles, Cal. Tie plates are now of rolled steel, instead of cast, malleable, or wrought iron; they have been increased in size with heavy double shoulders and independent fastenings. The bearing face of the plates is cambered to ensure even distribution of the wheel load, thus reducing cutting into the sleeper. Anti-creepers or rail anchors are the latest development and it is claimed that no device has done more to improve track maintenance and preserve safety.

To minimise speed restrictions at junctions the layouts have been improved and 39-ft. curved switches introduced. Wherever possible curves have been realigned to give a minimum curvature of one degree (87 ch.) and thus avoid any reduction of speed over them. High-speed trains demand adequate drainage of the roadbed and formation and stimulate the laying of line drains; for this work corrugated perforated pipes are used, and ballast cleaning equipment has been introduced for keeping the track ballast clean, thus improving drainage. The side wear of sharp curves has been much reduced since the introduction of rail lubricators.

When the U.S.A. entered the war in 1917, labour shortage became acute, and this began the great demand for power machines and tools; since then there have come on to the market tie tampers, rail laying machines, mechanical sleeper adzers, power wrenches, spike pullers and drivers, and many others which are described in more detail later in this article. It is worth noting, however, that the development in the use of power machines has changed the organisation of labour; the old section or length gangs have been gradually reduced to a skeleton organisation; the former division extra gangs, which were relatively small and could not be continuously employed on one specific task, have given way to the specialist gang. Such a gang has a particular job to do, such as rail laying, sleepering, surfacing, and ballasting or tightening bolts. Each man in a specialised gang becomes expert in a specific job.

Development in Bridges

Increased loads have called for the renewal of many bridges, and one feature of designs during recent years has been the attention paid to improving the architectural appearance. From the strength point of view Cooper's E-40 loading was quite common on main lines in 1916, but such bridges are now being replaced by structures designed to E-60 and E-72 loadings. Plate girders up to 150-ft. span are replacing the old type truss. Solid broad-flange beams up to 36-in. deep, weighing 300-lb. a foot, are used in preference to built-up members; for columns, heavy sections up to 16¾ in. by 18¼ in. weighing 426-lb. a foot are now available at the mills. By the employment of alloy steels, particularly silicon steel, a weight reduction of 33 per cent. has lowered appreciably the cost of long-span bridges. In lattice girders riveted connections have replaced those of pin type and solid diaphragms are taking the place of lacing bars in compression members. Rivet diameters have been increased from ¾ and ⅞ in. to 1⅛ and 1¼ in. Up to now there has been no general movement towards substituting welded for riveted connections. The combined length of wood trestles in service reaches the surprising total of about 2,500 miles. On some railways many of these structures have been replaced by concrete pile bents supporting wide-flange beams with ballasted tracks on concrete floors.

During the last ten years the rigid frame type of structure has been developed both in concrete and steel. In this form of concrete bridge as well as in the slab type, rails bear directly on the concrete without intervening ballast. On the other hand, ballasted track is being used more extensively on steel spans to improve the running, damp impact effects, and eliminate fire risks; for this purpose solid plate floors of wrought iron or steel are provided in preference to concrete, as they are lighter and require less constructional depth. Great attention is paid to simplifying and reducing maintenance. Several existing bridges have been strengthened by welding, thus saving costly replacement. When timber members are being renewed cutting and boring is done before creosoting. All bridge-maintenance gangs now have full power equipment and plant. Paint spraying is used in preference to hand paint-

* Summarised from a series of articles in the June, 1941, issue of *Railway Engineering & Maintenance*, which marked the 25th anniversary of the first appearance of that journal.

ing and the quality of the paint has been greatly improved. Rust inhibiting materials are now supplied which are dependable for stopping corrosion in steel and which are particularly suitable for use on surfaces where corrosion has already set in. The maintenance gangs are supplied with motorcars and motor lorries for conveying equipment.

Development in Buildings

Until 1916 American railways were still expanding, and utility, speed, and economy were the factors governing station construction and design; towns developed quickly and stations soon became inadequate. Twenty-five years ago railway expansion reached its peak and in the years following several magnificent terminals were erected to meet the physical and architectural demands of the time; in addition some fine stations were built to serve the more important cities. When streamlined trains were introduced in 1934 the reaction on the travelling public of modern standards of comfort and convenience made clear the desirability of providing stations in keeping with those standards. In spite of difficult financial conditions many stations were rebuilt or, where feasible, modernised.

On the equipment side also much has been done during the last 20 years. In particular many of the old timber gravity coal stages have been replaced by concrete or steel structures up to 1,250 tons capacity, many with automatic operation and control. Floors have been improved at passenger stations, goods sheds, warehouses, running sheds, and workshops. For stations, coloured non-slip tiles, specially treated concrete surfaces, colourful linoleums, and asphalte tile patterns are popular, and for resurfacing worn floors many mastic surfacing materials have become available. For goods sheds and workshops, creosoted wood blocks and concrete are commonly used. Lately creosoted black-gum plank is increasing in favour for such purposes, as it provides a good surface for barrows and is very resistant to wear.

Copper bearing steel window frames and sashes have replaced wood; the larger windows have mechanical means of opening and closing. For engine sheds, warehouses, and so forth, where large openings are needed, there are now available hinged, sliding, bi-folding, and rolling shutter type doors, and several kinds of the vertical lift overhead type.

Central heating has changed very little lately, but has been made more efficient by fitting thermostatic control. In some stations, offices, and stores combined heating and air conditioning has been installed. Perhaps the most important development has been the application of thermal insulation. It has been used for many years in connection with refrigeration and it is now available in forms suitable for general buildings. Experience has proved that when a building is fully insulated the resultant saving is often sufficient to defray the cost of both the insulation and heating plant within five years.

Development in Water Service

There have been drastic changes in railway water supply during the last 25 years to meet the special demands of larger locomotives, higher boiler pressures, longer overall runs, and shorter turn-round times. Until about 1900 water stations were steam driven but at that time the combined gasoline engine and pump was developed for the smaller stations. The rising price of gasoline, however, ceased to make this form of a power a serious competitor with steam, but the introduction of the semi-diesel engine made available for these purposes an economic power unit as reliable as steam. As electric power became more widely available other forms of power have been displaced in many cases. It is easily made automatic and requires very little attention, and savings up to 72 per cent. a year on the outlay have resulted by the installation of electric power sets. Of the 16,700 water stations on American railways 27 per cent. are now electrically driven. Reciprocating pumps are giving way to the centrifugal type.

Storage tanks for water are now being made up to 100,000 gal. capacity as against about 50,000 gal. in 1916. Due to the trouble experienced in maintaining steel tanks and preventing corrosion there has been a general reversion to timber, but this is now creosoted to increase service life. To meet the increased water capacity of locomotive tenders and to cut down the time required for taking water, the delivery rate of water columns has been increased from about 1,500 to such an exceptional figure as 6,000 gal. a minute. As to water softening, in 1916 only 480 plants existed and some 8 per cent. of the water used for locomotives was treated; by 1927 this had increased to 1,200 plants, treating 18 per cent. of the total water supplied. At the present time there are 3,250 plants which deal with 38 per cent. of all the water consumed. One of the real advances in treatment, particularly when used with the lime-soda ash process, has been the introduction of sodium aluminate. It is a better coagulant than either alum or copperas; also it accelerates the chemical reactions, and makes possible a lower residual hardness than can be obtained by lime and soda ash alone. During the last 25 years water treatment has become a far more exact scientific process; water is now being softened to a residual hardness as low as 1 gr. per gal., and engine failures, which used to be about 1 in 5,000 miles, have been brought down to 1 in 10,000,000 engine miles. So great have been recent advances that all plant, materials, and processes used in 1916 are now obsolete.

Mechanical Equipment

Within the last quarter of a century manpower has given way to horsepower. As a result of invention, education, and the absolute need for greater speed and economy, the comparatively few units of equipment available in 1916 have now grown to over 125 kinds and types of power tools. In the four years 1937 to 1940 inclusive the railways of the United States and Canada purchased some 13,600 units of power equipment at a cost exceeding $20,000,000, and the estimated expenditure for 1941 was over $7,700,000 for 5,700 units. Most railways retain section gangs, though some are little more than skeleton gangs, but all large-scale programme work is now done by fully-equipped rail-laying gangs, surfacing gangs, resleepering gangs, ballasting gangs, ditching gangs, steel-bridge gangs, and carpenter gangs; each gang specialises in the operation assigned to it and is specially equipped to do the work with maximum speed and economy. The progress of power plant is undoubtedly due to the development of the internal-combustion engine; it was first introduced to produce the power trolley in about 1896. The efficiency of these engines has grown steadily, and engines now develop two to three times the horsepower of those of 25 years ago for equal bore and stroke. Transmission has been improved both in the clutch and belt drive. Belts on inspection and gang cars today commonly give a service life of 50,000 to 75,000 miles.

Tie tampers driven by compressed air first came into the picture in 1912. The original plants were 4-tool machines; now sets operating 24 tools are available and the pneumatic tampers themselves have been much improved. Electric tampers came into use some 15 years ago, and use petrol-driven electric generators. The latest development is the unit tie tamper introduced in 1935; as it is self contained it is useful for a small gang on spot tamping work. The adoption of such heavy section rails as 131 and 152 lb. created the demand for power to handle them. In 1916 the locomotive crane began to be used for this purpose, but special cranes have since been developed, and indeed the earlier types dating back to 1926 are already obsolete.

Since the portable compressors designed for tie tampers were available, power wrenches, drills, adzers, spike pullers, and drivers which could be powered from these compressors have been introduced and perfected during recent years. For the repair of battered rail ends both by oxy-acetylene and electric-arc welding and the reconditioning of worn points and crossings, similar methods have all been developed within the period under review, followed quite recently by flash butt-welding of rail joints. These processes have brought with them the development of grinders, most of them driven from portable power plants. The welding of rail ends produced the need of the precision grinders now available.

Ditching and Grading

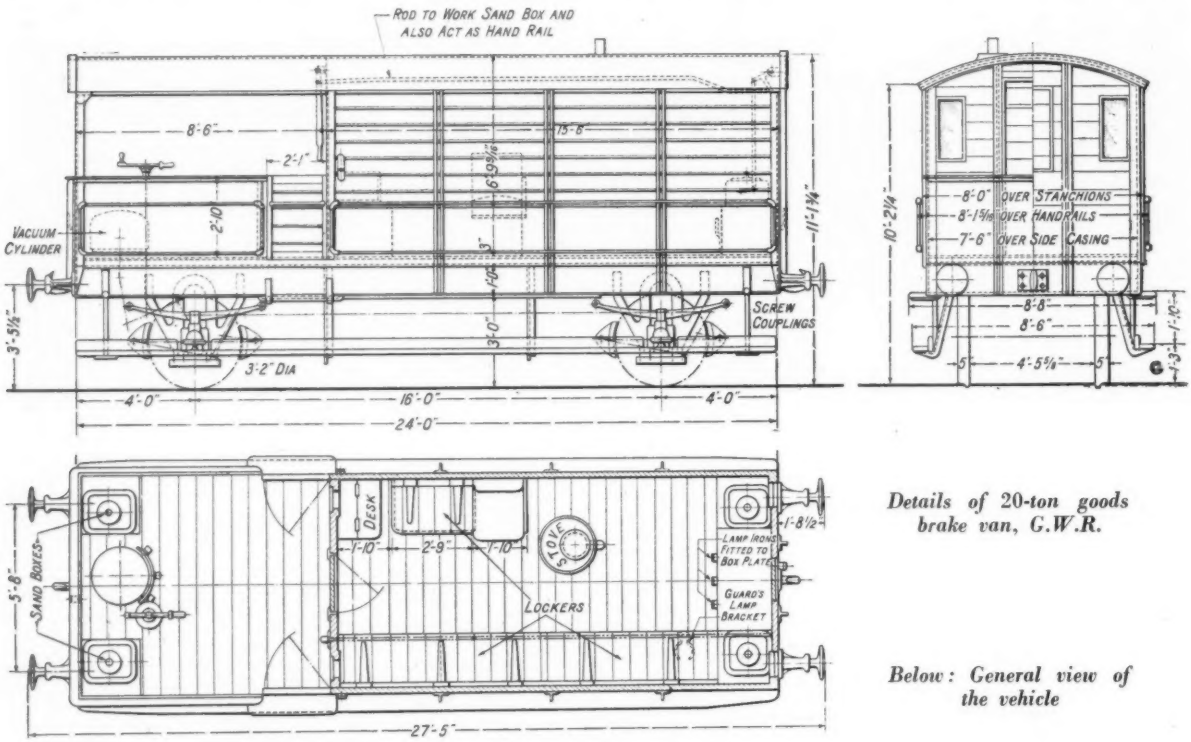
Need for machinery to carry out ditching and grading under maintenance conditions without interference with traffic has led to the introduction during the last few years of diesel or electrically-driven cranes, combined shovel and dragline units on caterpillar tracks which can work from the ground or off flat wagons. Another development has been the caterpillar tractor with many types of attachments for excavating, spreading, hauling, and consolidating material. Until about 15 years ago ballast cleaning was recognised as a tedious handfork-and-screen operation. In 1922 trials were made using locomotive cranes with grabs and screens mounted on gondola cars; they succeeded in reducing costs but tied up the cranes at seasons of the year when they were most required for other work. The first really successful self-contained machine capable of operating clear of passing traffic appeared in 1926. Later a belt conveyor was added for the purpose of removing the screenings to the side of the track. Indeed, the list of power tools now in use on American railways appears endless; lack of space prevents a description of but more than some of them in this brief review. Only a few of them, it may be noted, have their counterparts on British lines. In spite, however, of all that has so far been accomplished in the mechanisation of way and works maintenance it is reported that there is still need of further development in equipment to meet the changing needs of maintenance staffs. It is confidently expected that the present plant will seem as obsolete 25 years hence as do today those units which were available a quarter of a century ago.

G.W.R. 20-ton Goods Brake Vans

CONSIDERABLE improvements in the design of freight rolling stock including goods brake vans and covered wagons of different types have been effected on British railways during the past several years and similar advances have also been made where some of the open types are concerned. The vehicle illustrated and described herewith by courtesy of Mr. F. W. Hawksworth, Chief Mechanical Engineer of the Great Western Railway, is a 20-ton goods brake van for the Great Western Railway built in the company's works.

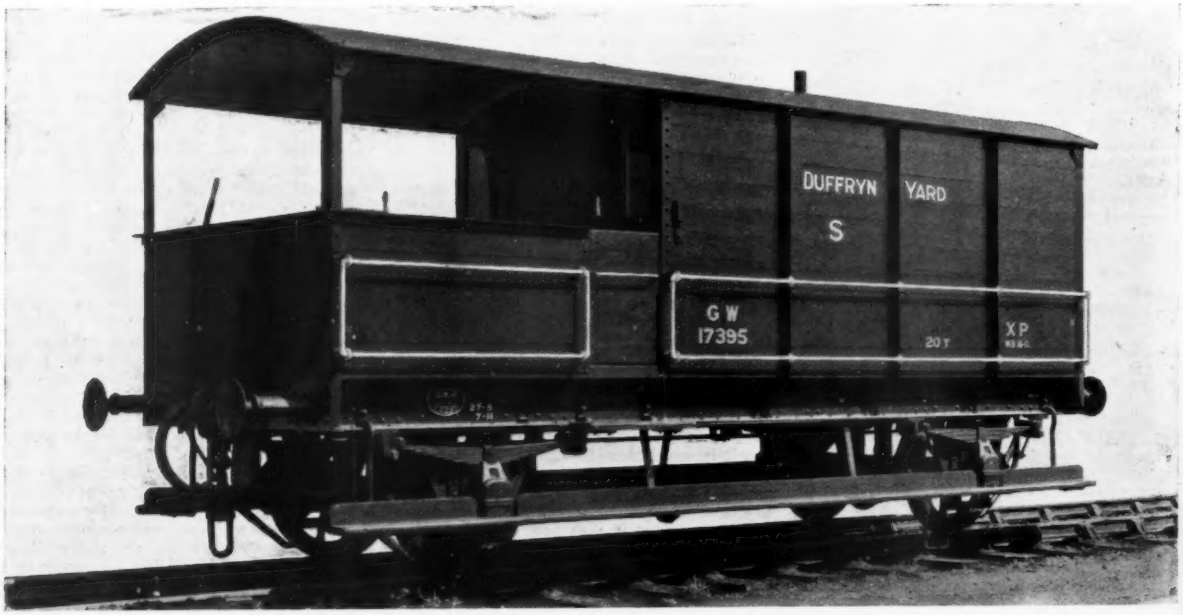
The vehicle is 24 ft. long over headstocks and 8 ft. wide, with a wheelbase of 16 ft. The underframes are of riveted construction and built of British standard rolled steel sections. The buffing and drawgear is to the R.C.H. standard with steel coil springs and auxiliary rubber pads. Ballast pockets are formed between the underframe members so that the tare weight of 20 tons can be obtained for braking purposes; the steel stanchions which form the framework of the body are riveted to the underframe and carry the eave rail and roof members. The body, with the exception of the lower part behind the lockers and the verandah which is steelplated, is of timber bolted to the stanchions, while the roof is constructed of thick boarding covered with canvas.

The van is equipped with a coal-fired stove for heating purposes and food warm-



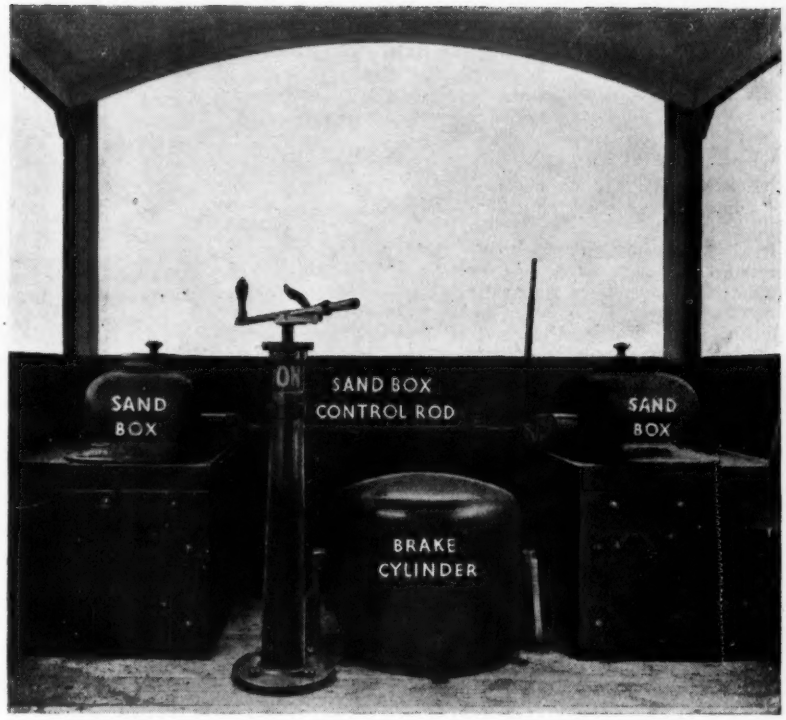
Details of 20-ton goods brake van, G.W.R.

Below: General view of the vehicle



ing, and lockers are provided for coal, A.R.P. equipment, spare couplings, etc., and a padded seat and desk are provided for the guard. The verandah, which besides being an efficient observation platform, has on it all the operating gear, namely, the hand brake, vacuum brake gauge and setter, and the levers for operating the sanding gear at either end of the van. Because of the restricted space under the frame due to the ballasting, the vacuum cylinder is housed on the verandah as shown on the drawing and one of the accompanying photographic illustrations, which also give an idea of the unrestricted view from the verandah.

The vacuum brake is fitted on vans used in fast freight working, which also have screw couplings instead of the usual 3-link couplings. Handrails and step-boards are fitted outside to both sides of the van for the convenience of the guard. The hand-railing is painted white for the convenience of the guard and others after dark; the lettering is also in white.



Right: View of verandah showing location of vacuum brake cylinder and sandboxes. C.W.R. 20-ton goods brake van

A New Locomotive Wheel Arrangement

THE Chesapeake & Ohio Railway recently placed in service a fleet of ten new "1600 series" freight locomotives of very large size and distinctively new design, embodying a wheel arrangement, 2-6-6-6, not previously used in locomotive construction. Larger and more powerful than any heretofore operated by the C. & O. Railway, the new engines have been assigned to service in the heavy coal freight traffic moving over the route traversing the Allegheny mountains, between Clifton Forge, Va., and Hinton, W. Va. Their appearance on this run a few months back, when the first of the engines was commissioned in service, has been occasioning considerable interest and curiosity.

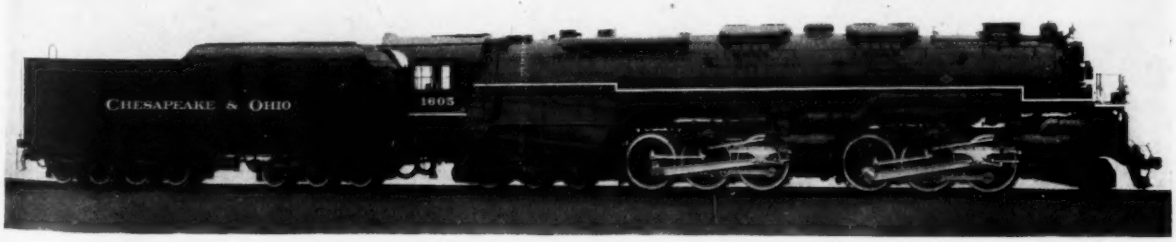
The name, "Allegheny Type," has been chosen to designate the design and wheel arrangement introduced by the new locomotives which, as the illustration shows, have two sets of six-wheel driving units, a six-wheel trailing bogie under the firebox and a two-wheel leading truck. This wheel arrangement is said to contribute maximum grate and combustion area and volume, enabling the use of greater boiler capacity; the engine and tender have a combined overall length of approximately 113 ft. The four cylinders are 22½ in. dia. by 33 in., stroke and fed directly from the boiler. Roller bearings are fitted to the journals of the engine bogie and coupled wheels. The boiler pressure is 260 lb. a sq. in. The locomotives have a maximum starting effort of 110,200 lb., and are capable of a sustained speed of 70 miles an hour.

In the brief period of their operation between Clifton Forge and Hinton the new engines have amply demonstrated their efficiency and adaptability in the movement of the heavy bituminous coal traffic over the grades of this mountain route. As a result of their proved efficiency the C. & O. Railway has placed an order with the builders, the Lima Locomotive Works Inc., for an additional ten locomotives of the same design.

The weight in working order (engine only) is 323 (long) tons 8 cwt., and the combined weight of engine and tender in working order 514 (long) tons 5 cwt. For improved weight distribution, the tender employs one six-wheel and one eight-wheel bogie. The tender capacity is 25 tons of coal and 25,000 U.S. gal. water. Other particulars are as follow :—

Wheels (coupled), dia.	5 ft. 7 in.
Wheelbase (engine)	62 ft. 6 in.
,, ,, (and tender)	112 ft. 11 in.
Boiler heating surfaces—	
Tubes and flues	6,478 sq. ft.
Thermic syphons	162 ,,
Firebox and comb. chamber	600 ,,
Total evaporative	7,240 ,,
Superheater	3,186 ,,
Combined total	10,426 ,,
Grate area	135·2 sq. ft.

Impressive in appearance as well as size, the new locomotives resemble only slightly the Mallet engines that have been in operation on the same railway for several years. They are provided with two complete sets of frames, flexibly connected beneath the boiler, to enable engines of their great length to negotiate curves easily and safely. The new "Allegheny Type" of locomotive was originated and developed by the Mechanical Department of the Chesapeake & Ohio Railway, under the direction of its Chief Mechanical Officer, Mr. D. S. Ellis, of Cleveland, Ohio.



Mallet 2-6-6-6 type locomotive, Chesapeake & Ohio Railway

Narrow-Gauge Sections of the N.W.R. II—The Kangra Valley Line

This 2-ft. 6-in.-gauge section involved many heavy works during construction

(*See illustrations on pages 37 and 38*)

GEOGRAPHICALLY, the next section of narrow gauge line northwards from the Kalka—Simla is the Kangra Valley railway. It runs from Pathankot, the terminus of a fairly busy broad gauge branch line originating at Amritsar, eastwards up the Kangra and other valleys among the foothills of that notable spur of the Himalayas known as the Daula Dhar range, near Dharamsala—a Gurkha military station—through Palampur a budding semi-hill station, popular among Indians, to Baijnath and Joginder Nagar; the last 14½ miles of ultra-heavily-graded line from Baijnath to Joginder Nagar are at present closed. The total length as constructed is 103 miles.

Pathankot is the railhead whence runs the motor road to Dalhousie, a military and civil hill station, as well as the transhipment station for the narrow-gauge line, and here is the principal locomotive depot. The ruling grade throughout the 89 miles thence to Baijnath is 1 in 50, but there is a long 1 in 25 grade on the 14-mile length beyond.

This line had a dual origin. For many years there had been a demand for the opening up of this beautiful Kangra Valley area, and for the provision of a better outlet from that higher and even more beautiful orchard district known as the Kulu Valley, which produces some of the best fruit—including the finest kinds of English apples—in the Indian Empire. The motor road beyond Baijnath and Joginder Nagar also taps a wide mountain region with considerable prospects of development.

The Uhl Hydro-Electric Scheme

What finally made a railway indispensable was the decision to construct the great Uhl River hydro-electric power plant at Joginder Nagar. Behind that town is a lofty spur of the Daula Dhar range beyond which flows the Uhl in a valley some 2,000 ft. higher than Joginder Nagar. The waters of this river are now diverted through a three-mile tunnel under the spur, and finally dropped straight down the steep mountain side in great penstock pipes nearly a mile in length into the Joginder Nagar power house. To transport the heavy machinery and other plant for this installation, the hill road from Pathankot was inadequate and a railway had to be built. The road, however, is very suitable for ordinary motor traffic, with which the railway has great difficulty in competing successfully. Heavy bridging and considerable lengths of extremely heavy earthwork caused the construction cost of the railway to be abnormally high, and consequently it is burdened with interest charges that absorb operating profits.

So heavy is the bridging that there are no fewer than 11,000 ft. in aggregate of steel girder bridges alone, three of which are illustrated. The most spectacular is the Reond steel arch, the only railway structure of its kind in India. It bridges a chasm 200 ft. deep and with nearly vertical sides. The arch span—shown whilst under construction in our illustration—is 180 ft. in length, and it is flanked on each side by a 40-ft. plate girder span. Soon after leaving Pathankot the first and longest of the girder bridges is crossed; it spans the Gaj river, which, though almost dry in the cold weather, is a wide torrent during the rains.

Another unusual feature of this railway is that it runs through an area subject at long intervals to severe earthquakes. A very serious series of shocks occurred at Dharamsala some years ago, as a result of which many lives were lost and much damage was done. Consequently, the railway buildings are built mainly with wooden frames, the panels of which are filled with brick nogging or stone.

Scenically, the show spot on the line is Palampur, which nestles right under the slopes of the Dhaula Dhar range. Throughout the winter months this range is snowclad, as may be seen from two of our illustrations. A good idea of the country at the Pathankot end of the line is obtained from the illustration of the Gaj river bridge, whereas the central part of the railway is more enclosed in valleys and gorges such as are depicted in the illustrations of a train crossing a big-span bridge, and of the steel arch. Further up again the country is more open, as at Palampur where the Sentinel railcar was photographed. At the top of the 1 in 25 ascent beyond Baijnath there is a wide open tract of country sufficiently high, and otherwise admirably suited, to be a site for a future hill station.

Locomotives and Rolling Stock

The passenger and goods traffic is worked mainly with a very sturdy and powerful 2-8-2 type of locomotive of the "ZE" class, one of which is illustrated, and by earlier 2-8-2 and 4-6-2 tender engines, two of which may be seen crossing the big-span bridge. The latest "ZE" engines are thoroughly up to date in all respects, and their wide fireboxes and large boilers provide ample power for working on the long 1 in 50 grades of the Kangra Valley branch. Before it was closed, the final 14-mile 1 in 25 section was worked with the Kitson-Meyer articulated locomotives transferred from the Kalka—Simla line. In addition to the ordinary passenger trains, there is a Sentinel-Cammell supplementary railcar service on this line, serving a purpose akin to that of the petrol and diesel cars running to Simla. The passenger stock is similar to that used on the Kalka—Simla section—bogie lavatory vehicles—and the goods stock is also interchangeable; all passenger and goods stock on both branches is fully vacuum braked.

Road through the Transandine Railway Tunnel

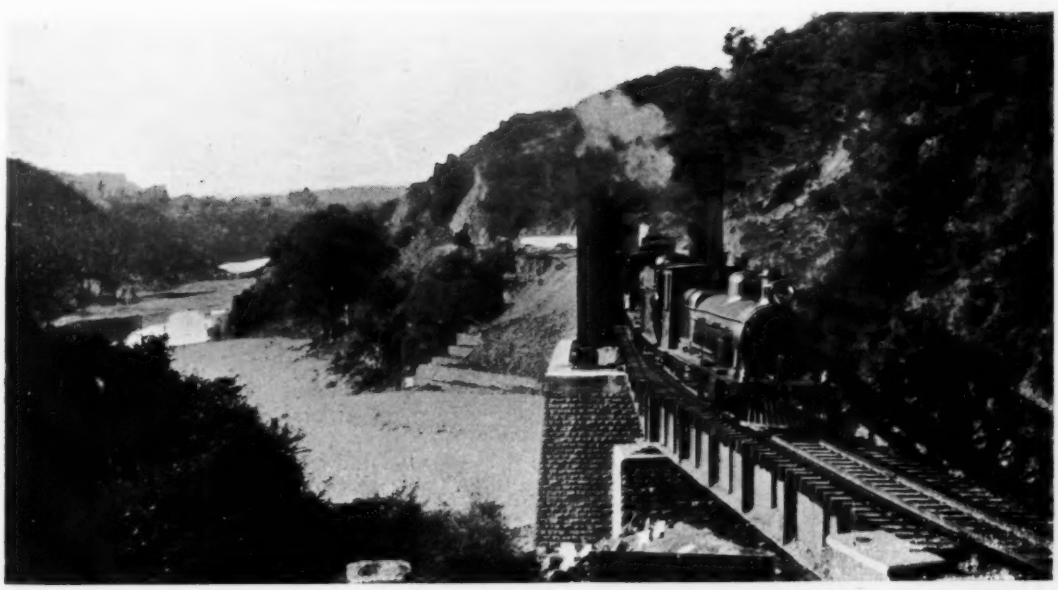
The well-known Transandine railway tunnel which pierces the backbone of the Andes and unites the Republics of Argentina and Chile has been opened recently to road motor traffic. The Argentine Transandine Railway was purchased by the Argentine Government in 1939 and incorporated in the State Railway system. On the Chilean side the railway is owned by the Chilean Transandine Railway Co. Ltd., but is leased to and worked by the Chilean State Railways. The Transandine railway tunnel is just under 2 miles in length and is nearly 2 miles above sea level. When it was opened in 1909 there was no thought of using it for motorcar traffic, but the subsequent construction of the Transandine Highway has resulted in the development of a considerable volume of road traffic consisting of both motorbuses and private motorcars. The conversion of the tunnel to its present combined rail and road use was facilitated by the fact that the tunnel is nearly 15 ft. in width and carries a railway line of only metre gauge, used normally by only one train a day. Motorcars and lorries using the tunnel save a climb of some 3,000 ft. to the crest of the pass, which is approximately 13,300 above sea level and is blocked by snow for about eight months of the year. It has nevertheless been possible to keep open the highway on the Chilean side all the year round as far as the tunnel portal. This international motor road from Valparaiso (Chile) to Mendoza (Argentina) is about 250 miles long and is easily traversed in one day. The whole road from Valparaiso to Buenos Aires linking the Pacific and Atlantic oceans is upwards of 900 miles in length and forms an important strategic section of the Pan-American Highway, as shown on the map we reproduced at page 569 of our May 15 issue. A new 5-mile motor tunnel through the Andes at a much lower level than the existing railway tunnel is now under consideration so as to improve this important link in South American transport.

The importance of the road link between Argentina and Chile has been enhanced considerably by the fact that the through railway service between the two countries was interrupted as long ago as January, 1934, as the result of the destructive work of an avalanche. The present is not the first time that this tunnel has been used for road services for, in view of the length of time involved in the reconstruction of the railway, the possibility of using the Transandine tunnel for international motor traffic was discussed in 1939 at a conference held in Buenos Aires between representatives of the two Governments. An agreement was then signed stipulating in precise terms the manner in which such traffic should be controlled. Tolls were agreed at 5 Argentine pesos for a vehicle, and 50 Argentine centavos for a passenger. Other clauses related to safety precautions, operation, lighting, and signalling. The Argentine Roads Board built a junction road between the ordinary road and the entrance to the tunnel. This was approximately 1,200 metres long, and about 1½ km. from Las Cuevas. The Transandine tunnel was then opened temporarily to road services on February 10, 1940. It was not found possible to continue this facility after it had served during the worst of the weather conditions, as it was necessary to reconstruct the tunnel for permanent road and rail service.

Above: 10-span bridge over the Gaj river. This view gives a good idea of the country at the Pathankot end of the line, with the Daula Dhar snow range in the background

Left: Train crossing large-span girder bridge in difficult country

Below: Another view of the same bridge showing the gorge beyond, deep rock cuttings, and retaining walls



THE KANGRA VALLEY LINE

(See article on page 36)

Left: The Reond steel arch—the only one for a railway in India—under construction by the cantilever method with temporary tie-backs anchored in the rock. The span is 180 ft., and depth of the gorge 200 ft. Note light and heavy cableways for erection, and rugged surroundings

Sentinel-Cammell steam railcar at Palampur Station. The snow range in the background and snow line within a few thousand feet of the level of the station, and also the unusual relation between station building and platform, will be noted

Passenger train headed by a "ZE" 2-8-2 type locomotive taking water. Note the fireman cleaning ashpan and modern equipment of engine

RAILWAY NEWS SECTION

PERSONAL

Viscount Ridley, a Director of the London & North Eastern Railway Company, whose appointment as Director of Producer-Gas Vehicles in the Ministry of War Transport was recorded in our May 29 issue, has resigned that appointment on becoming Regional Controller (Northern) under the Ministry of Production. It was decided recently by Durham University to confer upon Lord Ridley the honorary degree of D.C.L.

Sir Alfred Faulkner has been appointed Director of Producer-Gas Vehicles in the Ministry of War Transport, in succession to Lord Ridley. Sir Alfred Faulkner has been Permanent Under-Secretary, Mines Department, since 1927.

We regret to record the death on July 6, at the age of 81, of Mr. Daniel Willard, Chairman, and for many years President, of the Baltimore & Ohio Railroad, and Chairman of the Reading Company.

We regret to record the death on June 21, at the age of 72, of Mr. T. Robinson, who, until his retirement in 1932, had been Assistant Works Manager at the London & North Eastern Railway works at Darlington.

Mr. J. Benstead, Assistant General Secretary, National Union of Railwaymen, has been elected to succeed Mr. J. Marchbank, on his retirement at the end of the year, as General Secretary.

Mr. Frederick Scopes has been appointed Managing Director of the Stanton Iron Works Co. Ltd., in succession to Mr. E. J. Fox, whose relinquishment of that appointment, and whose retirement from the board, were recorded in our June 26 issue.

Sir Ronald W. Matthews, Chairman, London & North Eastern Railway Company, has been elected a Director of the Legal & General Assurance Society Limited.

We regret to record the death, at the age of 59, of Mr. Robert J. Magor, President, National Steel Car Corporation, Canada.

Mr. Osborne Anthony George Edwards, Western District Engineer (Exeter), 1912-1921, of the former London & South Western Railway Company, who died on March 20 last, has left £3,542.

Sir Harold Clapp, formerly Chairman of Commissioners, Victorian Government Railways, has been appointed recently Director-General of Land Transport in Australia.

Mr. J. G. Annan has been elected a Director, to fill a vacancy on the London Board, of the Mexican Railway Co. Ltd.

We regret to record the death on June 28, at the age of 88, of Sir Trevredyn Wynne, K.C.S.I., K.C.I.E., M.Inst.C.E., Chairman & Managing Director, Bengal-Nagpur Railway Company. He was educated at Brighton College, and at the Royal Indian Engineering College, Cooper's Hill, and went to India as Assistant Railway Engineer, Public Works Department, in 1874. He joined the Bengal-Nagpur Railway, on its formation in 1887, as its first Agent & Chief Engineer. The nucleus of the Bengal-Nagpur system was the metre-gauge State Railway, of 146 miles, from Nagpur, the terminus in the Central Provinces of the Great Indian Peninsular Railway, to Raj Nandgaon, which was made over by the Secretary of State to the company, on the condition that it should be converted to the 5 ft. 6 in. gauge and extended, on the same gauge, to join the East Indian Railway at Asanol, 132 miles from Calcutta. Work on this line was begun in the winter of 1887, and, by reason of the energy of Mr. T. R. Wynne (as he was then) and that of his staff, the 627 miles of railway from Nagpur to Asanol were declared open throughout in March, 1891; further extensions followed at various dates. Mr. Wynne remained Agent & Chief Engineer until his appointment, in 1905, as a member of the newly-constituted Railway Board of India, of which he became President in 1908. He held this position until 1914, when he was appointed Government Director of Indian Railway Companies, India Office, London. He resigned this post in 1915, and in the same year became Managing Director, Bengal-Nagpur Railway Company; in 1930 he was elected Chairman. He was created C.I.E. in 1903, K.C.I.E. in 1909, and K.C.S.I. in 1911.

The late Sir Trevredyn Wynne, K.C.S.I., K.C.I.E.
Chairman & Managing Director, Bengal-Nagpur Railway Company, 1930-42

Mr. Ernest A. Novis, who retired on June 30 from position of City Agent in London for the Canadian National Railways, was born at Hastings, Sussex, in 1882. In 1904 he entered the service of the Grand Trunk Railway at Montreal, where he remained until 1912, when he returned to Europe, to work with the European organisation of the Grand Trunk, as a clerk in the Freight Department, London. In 1914 he was transferred to Liverpool, where he remained until he joined the Canadian Expeditionary Force in 1916. After demobilisation in March, 1919, he spent two further years at the Liverpool office. In September, 1921, on the amalgamation of the offices of the Canadian National and Grand Trunk Railways in Europe, Mr. Novis was transferred to London as Local Express Agent at the European Head Office in Cockspur Street, and he held subsequently the positions of Chief Clerk, Freight Department, and Freight Traffic Representative. In March, 1927, he became City Agent of the C.N.R. at the Traffic Office in Leadenhall Street.

Mr. William Taylor has been appointed City Agent in London for the Canadian National Railways, in succession to Mr. E. A. Novis. Mr. Taylor joined the staff of the Liverpool office of the Grand Trunk Railway over 35 years ago. In 1922 he was appointed Special Agent of the C.N.R. and of the Canadian Government Merchant Marine at Antwerp, where he remained until the invasion of Belgium in May, 1940. Since that date he has been attached to the C.N.R. Head Office in London.

The late Mr. G. E. Priestman, formerly Chairman, John Priestman & Co. Ltd., Bradford, left, amongst other bequests, £100 to the Railway Benevolent Institution.

A memorial service for Lord Glanely was held on July 2 at the Church of St. Andrew Undershaft, St. Mary Axe, E.C. The Bishop of Kensington officiated and amongst those who attended were: The Rt. Hon. Lord Palmer (Deputy Chairman, Great Western Railway Company); Sir James Milne (General Manager, Great Western Railway); Mr. F. R. E. Davis (Secretary, Great Western Railway); Mr. S. B. Taylor (Assistant to the Secretary, Great Western Railway), also represent-

ing Sir Charles J. Hambro; and Mr. F. A. Leathers, also representing the Rt. Hon. Lord Leathers.

Mr. H. E. O. Wheeler, Superintendent of Operation, Southern Railway, who, as recorded in our July 3 issue, has been

Elliott & Fry

Mr. H. E. O. Wheeler, O.B.E.

Appointed Deputy Traffic Manager, Southern Railway

appointed Deputy Traffic Manager, Southern Railway, as from July 1, 1942, is the youngest son of the late Judge Wheeler, K.C., and was educated at Windlesham House, Brighton, Preparatory School, and at Uppingham. He joined the Audit Accountant's Department of the former South Eastern Railway in December, 1896, and in 1898 he was transferred to the Office of the Superintendent of the Line, where, in the various sections of that office, his railway experience was chiefly gained during the next thirteen years. On the appointment of Mr. (now Sir) Francis Dent as General Manager in 1911, Mr. Wheeler was promoted to the post of Traffic Superintendent, London District, which position he held until May, 1918; from then until January 1, 1920, he acted as Assistant Superintendent, and was appointed to this position on the latter date. In 1923, on the formation of the Southern Railway, he was appointed Assistant Operating Superintendent for Train Services, which position he held until 1930, when he was made General Assistant to the Traffic Manager. In 1936 he became Superintendent of Operation. Mr. Wheeler was appointed an officer of the Order of the British Empire in 1916, and he is an ordinary member of the Council of the Institute of Transport.

Mr. P. Liddell, whose retirement from the position of Docks Machinery Engineer, Hull, L.N.E.R., was recorded in our June 26 issue, served his apprenticeship as an engineer at the central marine-engine works of William Gray & Co. Ltd., West Hartlepool. He spent eight years (from 1898 to 1906) at sea as a marine engineer; during the last three years of this period he was Chief Engineer. He entered the service of the former North Eastern Railway in July, 1906, as Marine & General Machinery Inspector in the Outside Machinery Department. In 1914 he was appointed Outside Machinery Superintendent, and in 1934 became Docks Machinery Engineer. In this capacity Mr. Liddell was responsible for the design, installation, and maintenance of all

Mr. P. Liddell

Docks Machinery Engineer, Hull, L.N.E.R., 1934-42

power-driven dock machinery, used for loading and unloading ships, and for the movement of traffic in docks and warehouses.

Mr. C. Hartman, Assistant District Superintendent, Nottingham, L.N.E.R., who, as recorded in our June 26 issue, has been appointed to act as District Superintendent, Leeds, was educated at the Aske's Haberdashers' School, Hampstead, and at the Northampton Polytechnic Institute, where he took the

Mr. Samuel Jackson

Who has been elected a Director of Beyer, Peacock & Co. Ltd.

degree of B.Sc. (Engineering) in 1921. He entered the service of the London & North Eastern Railway in 1923, as a traffic apprentice, and obtained experience in various departments. In 1926 he was appointed Assistant Yardmaster, Doncaster, and, shortly afterwards, to a

Mr. C. Hartman

Appointed to act as District Superintendent, Leeds, L.N.E.R.

similar post at Ferme Park. Mr. Hartman became Assistant Yardmaster, King's Cross, in 1928; Assistant to the District Superintendent, Nottingham, four years later; and Assistant District Superintendent there in 1934.

Mr. Samuel Jackson, M.I.Mech.E., M.I.Loco.E., Works Director of Gorton Foundry, Manchester, has been elected to the board of Beyer, Peacock & Co. Ltd. Mr. Jackson has been with the company for a period of 42 years, having commenced in 1900 a three years' pupilage at Gorton, after serving as a premium apprentice at Crewe works of the L.N.W.R. for four years. On completion of his pupilage he was engaged as a draughtsman, and for eight years was in the special designing department where new designs of locomotives are prepared. During this period the well-known Garratt locomotive was originated, and Mr. Jackson, in collaboration with the late Mr. H. W. Garratt, made the first design, and this was used for the Patent Specification. Since that date he has been responsible for the design and manufacture of a considerable number of Beyer-Garratt and other locomotives for many parts of the world. In 1913 he was appointed Assistant Works Manager and later became successively Works Manager, Chief Designer, and Local Director. Mr. Jackson will continue his executive duties at Gorton as Works Director.

Indian Staff Changes

Mr. E. M. Egan has been appointed to officiate as Deputy Chief Commercial Manager, N.W.R., in place of Mr. Proudlock.

Mr. T. G. R. Eagan has been appointed to officiate as Divisional Superintendent, Ferozepur, N.W.R.

TRANSPORT SERVICES AND THE WAR—147

Transport of Racehorses

No rail facilities for the transport of racehorses will be granted after September 15. For this reason Epsom-trained horses will not run at Newmarket meetings after that date. The last of the races open to all horses will be the St. Leger and the Dewhurst Stakes, which will be decided at Newmarket on September 12. Road transport will be permitted, but will be limited to 45 miles.

Palace Gates Branch Train Service

In order to save locomotive power, the L.N.E.R. shuttle service between Seven Sisters and Palace Gates was withdrawn on Monday last, July 6. The Palace Gates branch is now served daily by the through trains between Palace Gates and North Woolwich, which have been adjusted to provide convenient connections at Seven Sisters with the Liverpool Street to Enfield Town trains. Workers will be but little affected by this, as there are still sufficient trains at peak hours, but on Mondays to Fridays there are no trains during the non-peak hours. The Sunday service remains unaltered.

Drastic Motorcoach Cuts

During the past few days further drastic cuts have been made in motorcoach services in order to save petrol and tyres. On the instruction of the Minister of War Transport, the Regional Transport Commissioners have been reviewing coach services with the object of making the greatest use of other means of transport, and the cuts involve complete withdrawal of services running parallel with railways, and the curtailment of other services so that they act only as feeders from isolated districts to the railways.

The principal group of services affected is that between London and East Anglia. These ceased to operate after June 30, but it was stated at the office of the Eastern Transport Commissioner that villages would get exactly the same service as hitherto for essential travel to London, but would have to make the journey partly by road and partly by rail; this arrangement is indicated by the footnotes to the following table, which shows the main services withdrawn or curtailed :—

Operator	Service
S. Blackwell & Sons ...	London (Kings Cross)—Earls Colne*
Corona Coaches (A. Chinery)	London (King Cross)—Hadleigh—Stowmarket†
Eastern Counties Omnibus Co. Ltd.	London (Victoria)—Many East Anglian points
Eastern National Omnibus Co. Ltd.	London (Kings Cross)—Halstead
Empire's Best(Webber)	London—Epping—Chelmsford —Colchester—Clacton
Grey-Green (George Ewer & Co. Ltd.)	London (Kings Cross)—Colchester—Clacton—Walton
Do.	London (Kings Cross)—Colchester—Harwich
Do.	London (Kings Cross)—Colchester—Ipswich—Felixtowe
Do.	London (Kings Cross)—Colchester—Ipswich—Yarmouth
Grey Pullman (G. F. Burgoin)	London (Kings Cross)—Haverhill—Great Thurlow‡
Hicks Bros. Ltd. ...	London—Braintree**
B. K. Jennings ...	London (Kings Cross)—Thaxted—Clare—Ashen††
Primrose Coaches ...	London (Kings Cross)—Chelmsford
Sutton's Crossley Coaches	London (Kings Cross)—Clacton—Jaywick Sands
Whippet Coaches ...	London (Kings Cross)—Papworth

* Now Earls Colne—Braintree only
† Now Stowmarket—Chelmsford only
‡ Now Great Thurlow and Haverhill—Bishops Stortford only
** Now Braintree—Harlow only
†† Now Ashen—Bishops Stortford only

It will be noticed that many of the routes terminated in London at the Kings Cross Coaching Station; actually the only coach service left at Kings Cross is that of Birch Bros. Ltd. to Bedford and Rushden. All the services of George Ewer & Co. Ltd. have been cancelled, leavng this company with nothing but its private hire business. All the motorcoach services of the Eastern Counties Omnibus Co. Ltd. have been withdrawn.

Another withdrawal from June 30 is the week-end extension from Oxford to Worcester of the London-Oxford service of the South Midland Motor Services Limited. Some journeys on the London-Brighton service of the Southdown Motor Services Limited have been discontinued.

From July 6 the London-Margate-Broadstairs-Ramsgate service of the East Kent Road Car Co. Ltd. has been withdrawn, but Thanet coach bookings are still made by means of the London-Canterbury-Deal service and shuttle connections between Canterbury and the Thanet points.

Road Speed Limits

In order to effect economies in the consumption of petrol and the wear to tyres, the Government has recommended that drivers of any motor vehicles should not normally exceed 40 m.p.h., but in view of the increase of both vehicles and manpower of the mobile police force which would be needed to enforce new statutory speed limits, the Government does not propose to make any legal changes. The Ministry of War Transport announced on June 17 that a speed limit of 40 m.p.h. had been fixed for the motor vehicles of Government departments, which was to be exceeded only for Service reasons of over-riding urgency. The Ministry of War Transport has expressed the view that careful driving can effect considerable savings in the wear and tear of tyres without slowing essential transport engaged on urgent war work.

Parking Buses in Central London

By eliminating non-essential journeys between 9 a.m. and 4 p.m. every day, the London Passenger Transport Board will run about 2,000,000 fewer miles a year and thereby save substantial quantities of petrol, fuel oil, and rubber. On about 80 routes, by arrangement with the authorities concerned, 550 buses are to be parked at various points in Central London during the slack hours of the day instead of returning to the outer terminals in the morning and then coming into town again for the evening peak traffic. The withdrawal of non-essential journeys relates only to the outward journey in the morning and to the return trip to town in the afternoon. At both times the flow of traffic is in the reverse direction; thus there will be ample accommodation for normal traffic. It is expected that a beginning will be made this month.

Motor Restrictions in Eire

Private motoring in Eire ceased on May 1, with the exception of a few cars which were given temporary permits expiring at the end of June (see our May 15 issue, page 577). Commercial vehicles were due to come under the permit systems on July 1, but a month's grace has been given, and a basic fuel allowance for July has been granted to all commercial goods vehicles. From August 1, however, the use of motor vans and small lorries up to 30 cwt. unladen is to be discontinued, apart from exceptional circumstances, and petrol permits will be granted only for heavier lorries engaged on essential services, such as wholesale food distribution.

Train Service Alterations in Eire

Various timetable changes came into force on the Great Southern Railways on June 29, designed to give improved services with the maximum fuel economy. They consist mainly of re-timings, but there are one or two trains withdrawn. The accommodation on the trains is strictly limited.

Withdrawal of German Restaurant Cars

The withdrawal from June 1 of restaurant cars in Germany (see our June 12 issue, page 657) applies to all internal services, but excludes certain international trains, which continue to have Mitropa dining cars. The withdrawn restaurant cars have been replaced by ordinary carriages, thus increasing the carrying capacity of the trains without adding to the tare weight.

Use of German Sleeping Cars

From June 15 accommodation in German first and second classes sleeping cars is available only for persons travelling on behalf of a Government office, a Party office, or a firm. Moreover, they must hold a certificate from the office or firm that the facility is essential. Private individuals must give a similar written declaration. Penalties are provided for using a sleeping berth without good reason. There are exceptions for war cripples and for wounded soldiers. Third class sleeping cars are not affected by this regulation, according to the *Frankfurter Zeitung* of June 8.

German Controllers of Local Transport.

In 1936, by Decree of the German Minister of Transport, Controllers of Local Transport were established. In May, 1940, it was stated that the most important duties of the controllers were the transport of goods to and from the railways and the ports of the inland waterways; the supply of essential goods to the population; the transport of workers to and from their work; the transport of materials to important firms, especially armaments and supply undertakings; and the carrying out of urgent and important operations, and in particular of building. The increasing importance of road transport, especially since the outbreak of war, has led to a great extension in the authority of the controllers. At the beginning of the war, when the requisitioning of lorries by the Armed Forces made necessary the control of lorry transport, the controllers became responsible for the transport of goods in which there was a regular traffic over the same route. The definition of their duties issued in May, 1940, gave them general supervision over road transport. This entailed supervision of the personnel of road transport undertakings; the allocation of lorries and trailers; the distribution, in conjunction with the Land Economic Offices, of fuel and tyres for road vehicles; and the carrying out of repairs on road transport vehicles. Local passenger transport is controlled primarily by the local government authorities and by the local police. According to the *Kölnische Zeitung* of April 29, however, the Controllers of Local Traffic have now become responsible for the efficiency of the passenger transport services, as regards both personnel and vehicles. In conjunction with the local civil and police authorities, they now have the right to determine what traffic parti-

cular passenger transport services are to carry, to reduce the number of stopping places, and so on. They are also responsible for the technical supervision of the tramways.

Further French Train Service Reductions

Passenger train services in France were further reduced on July 1 as a result of shortage of rolling stock, according to a Vichy official statement quoted by Rome.

Horse-Drawn Buses in Szeged

Szeged, the second largest town in Hungary, recently reintroduced horse buses, in view of the threatened discontinuance of the motorbus services. The districts of the town to the east and west of the River Tisza are now connected by horse-drawn buses as in the early years of the century.

Mine Danger to Swedish Ferry Services

The Swedish-Danish Railway Commission has decided to suspend the ferry between Copenhagen and Malmo from July 12, according to a Stockholm dispatch. By then it is hoped that the ferry system between Trelleborg and Sassnitz, suspended since June 25 by reason of the danger from mines and submarines, may be restored. Otherwise the only link between Sweden and the continent would be the ferry between Helsingborg and Elsinore.

Producer Gas Tests in Sweden

Lengthy tests have been conducted in Sweden with 38 types of producer-gas plants in 127 vehicles; of these, 22 types used wood and 16 wood charcoal. The down-draught class of producer was found to give the best results with wood fuels, but the cross-draught type was best with charcoal. It is to be noted that Swedish charcoal is not so free from tar as retort-oven hardwood charcoal. On the road tests the wood-burning producers showed generally better starting characteristics after stops than did the charcoal burners. With both types of fuel the gas values seemed to range from 68 to 71 b.t.u. per cu. ft. Over test courses of 330 to 460 miles the average speeds varied from 22 m.p.h. with the heaviest lorries to 42 m.p.h. with private cars.

A Wartime Orient Express

The Italian State Railways, in conjunction with the Croat and Serbian Railways in occupied Jugoslavia, and the Bulgarian State Railways, inaugurated on May 4 a twice-weekly Orient Express between the French frontier and Salonika and Sofia. The route is from Bardonecchia (the Italian frontier station), *via* the Mont Cenis Tunnel, Turin, Milan, Triest, Ljubljana, Zagreb, and Belgrade, to Nish, where the train is divided into a Salonika and a Sofia portion. This route varies between the French frontier and Milan from the pre-war Simplon Orient Express route, and the name of the train is now the Mont-Cenis Orient Express. The French National Railways provide a connection by express train between Paris, Lyons, and Bardonecchia, and at Milan connections are made with Genoa and Swiss expresses.

Chinese Demolish Strategic Line

More than 200 bridges and tunnels on the Chekiang-Kiangsi Railway were blown up as soon as the Japanese offensive in these districts began to develop. Demolition on the last section of the line to be destroyed took place on June 15 between Kweiki and Tengchiapu. The Director of the railway said it would take from three to five months to repair the line. The personnel of 8,000 were withdrawn to await orders from the Chinese Central Government, according to a Chungking message.

Fuel Rationing in Brazil

Petrol rationing has been enforced throughout Brazil since May 1. It is hoped to effect an annual reduction in consumption by 1,000,000 gal.

The Seatless Tramcar

A seatless tramcar, accommodating 100 standing passengers, has been introduced experimentally as a wartime measure in Santiago, Chile, according to recent press reports.

Canadian Motorcar Restrictions

Under an Order of the Canadian Transit Controller dated April 16, passenger motorcars in Canada may not be used as taxicabs or drive-yourself cars unless they were so operated during 1941.

Traffic to Alaska Restricted

From July 11 all civilian traffic between Alaska and other parts of the United States will be banned, excepting under permit from the U.S.A. military authorities.

Public Railway Services in Malaya

According to a Japanese news agency message from Tokio, a regular public passenger train service was inaugurated on July 1 between Bangkok, the capital of Siam, and Singapore.

Re-opening of Philippine Railways

The railway from Manila to Batangas, which is approximately 70 miles long, was re-opened on July 1. The line from Manila to Kalumpit, 35 miles long, was re-opened on the next day, according to Tokyo advices. Both of these lines were partly destroyed by the American troops.

Control of Japanese Transport

As the Japanese railways are required to carry more traffic so as to release coastal shipping space for war purposes, the Japanese Government has established a Central Railway Transport Board of 30 members under the chairmanship of the Minister of Railways, and smaller divisional transport boards under the chairmanship of divisional managers, to control all rail transport. The system now working in Germany has been copied.

Pullman Wartime Ships

The new Panama Limited train of the Illinois Central Railroad which went into service at the beginning of May, is announced as "positively the last new streamliner for the duration." The shops of its builder, the Pullman-Standard Car Manufacturing Company, have been cleared of all pre-war (in the U.S.A., pre-December last) passenger carriage orders, and have been turned over to pre-fabricating boat parts for the new Pullman shipyard on Lake Michigan.

U.S.A. Urban War Transport

A drastic curtailment in the use of private motorcars due to rubber shortage in the U.S.A. has resulted in a situation approaching a breakdown of local transport, as so many persons in the U.S.A. employ their private cars for business journeys. The Office of Defense Transportation has recommended the construction during the present year of 12,000 new motorbuses for urban services, 8,000 tramcars, and 600 trolleybuses. If all these vehicles are built, a matter which is dependent upon the availability of adequate materials, they will enable an increase of about 18 per cent. in carrying capacity to be provided. This may relieve the situation, but it cannot solve the difficulty, for the demands for urban transport are already estimated at upwards of 20 per cent. above those of last year. The O.D.T. has addressed a message to the Governors of all States and the mayors of all cities with more than 10,000 population asking them to organise a war transport programme which gives prominence to systematic staggering of business, school, and working hours.

Freight Control by U.S.A. Railways

A system of complete control of all railway freight (except U.S.A. Government shipments) moving to South American destinations through North American ports has recently been inaugurated by the U.S.A. railway companies. It is obviously in the best interests of the war effort that goods should be shipped from Gulf ports, thus saving a longer sea journey and the attendant risks of enemy interference, but such effective use is limited by the available cargo-handling equipment. During the last war, the prejudice of exporters against changing to other ports caused considerable confusion at docks, warehouses, and railway sidings, and the new control system is drafted to obviate a repetition of this.

If you can't always get a lower...

It's due to a Pullman car shortage that daily becomes more acute as America's war effort swings into full stride . . . as more and more cars are required for long distance troop movements.

Increased demands on the supply of Pullman cars allocated to civilian needs has resulted, at times, in a shortage of accommodations . . . a situation not always appreciated by many of our patrons seeking last minute reservations at peak periods. In peacetime, this condition would undoubtedly be relieved by the addition of necessary cars. But Pullman space these days is truly a war commodity, and frequently there are no extra cars available.

We of the New Haven Railroad are sincerely exerting every effort to supply the type of accommodations to which you have been accustomed. But if you can't always get a lower, we hope you will understand.

May we suggest that you make your reservations and purchase your tickets in advance . . . and that for the benefit of those who may be on waiting lists, you release accommodations promptly whenever you change your plans?

THE NEW HAVEN R. R.

The New York, New Haven and Hartford Railroad Co.

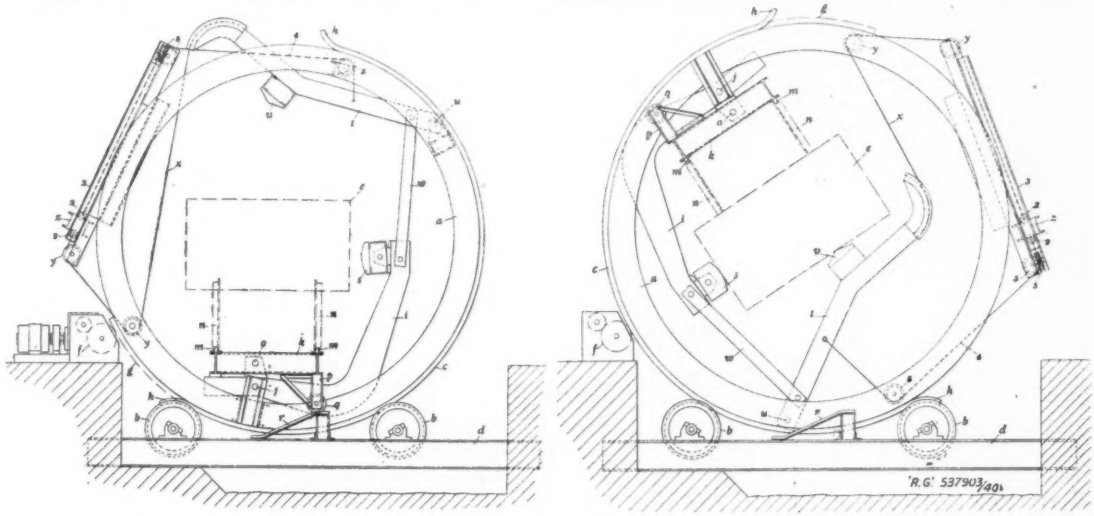
Another typical U.S.A. wartime "goodwill" advertisement

ABSTRACTS OF RECENT PATENTS*

No. 537,903. Wagon Tipplers

New Conveyor Co. Ltd. and William Cameron Murray, of Tat Bank House, Tat Bank Road, Oldbury, Worcestershire. (*Application date: April 9, 1940.*)

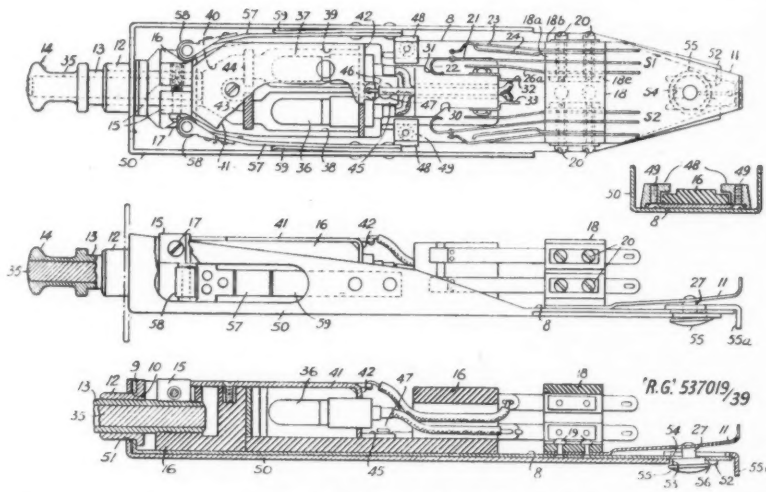
A rotary frame *a* is supported on rollers *b*, which engage tracks *c* on the end rings of the frame, and which are mounted on a foundation *d*. Rotation is effected by power-driven gear wheels *f* engaging segments *g*, stops *h* limiting such movement. Mounted within the frame *a* is a lever *i* connected by co-axial pivots *j* to the lower portion of the frame *a*. Above the pivot of the lever *i* is a platform *k* provided with rails *m* for the wheels *n* of a truck *e*. This platform is connected by co-axial pivots *o* to the lever *i*. Tilting of the platform *k* is prevented initially by legs *p* and rollers *q*, which rest on ramps *r* mounted on foundation *d*. At the upper end of lever *i* is a lateral abutment *s* against which one side of wagon *e* can bear. In the upper part of the frame *a* is another lever *t* connected to the frame by pivots *u*, and carrying a clamping bar *v* adapted to bear on the upper part of the wagon *e*. Lever *t* is connected to lever *i* by a link *w*. The free end of lever *t* is connected by cable *x*, passing over pulleys *y*, to a balance weight *z*, which is slidable by rollers 2 mounted between guides 3 on the frame *a*. The upper end of balance weight *z* is attached by cable 4, passing over pulleys 5, to the lever *t*. It will be seen readily that on tilting the tippler, clamping of the wagon is automatic.—(*Accepted July 11, 1941.*)



No. 537,019. Signal Controls

Arthur Vaughan Tomlinson, of 65, Victoria Street, London, S.W.1. (*Application date: November 30, 1939.*)

In a control device or switch for signals or points, indicator lamps, 36, 37 are placed in recesses 38, 39 in a cam member 16; one of the lamps is lit in one extreme position and the other is lit in the other extreme position. Illumination of the lamps is seen through aperture 40 and glass 35 in the operating handle 13 and knob 14 which slides in a bearing 12 in opening 10 of lug 9, and is screwed into a split collar 15 of cam 16; the collar is tightened by a screw 17. On pushing the handle 13 to the central position, cam surface 30 operates control contacts 22 of contact stack S 2. On pushing the handle 13 to its extreme position, cam surface 31 operates contacts 22 of stack S 1. These contact stacks S 1, S 2, are secured by rivets 19 to insulator 18 and base 8, and consist of two rows of contacts. The upper row of contacts consists of contacts 21, 22, 23, 26a, and stop 24 between insulators 18*a*, 18*b*, 18*c* which are attached to insulator 18 by screws 20. Contact 26*a* engages contact 32 on cam 16. Plate 41 with leg 42 encloses the recesses 38, 39. Illumination of the lamps is effected by contacts of cam 16 and stacks S 1, S 2, and the lamps may have colour filters 43, 44. Leg 42 has a projection 45 with a tapered hole 46 for the head of a pin 47 on cam 16. Cam 16 is engaged by guides 48 secured by screws 49. The assembly is mounted with a bracket 50 which has an opening 51 for handle 13, and a slot 52 and hole 53 for a pin 55 which also passes through opening 54 of base 8. Pin 55 is secured to spring 11 and has a shank 27, normally being held by a clip 55*a* so that shoulder 56 is in hole 53. Springs 57 with rollers 58 and stiffeners 59 co-operate with V-shaped cam surfaces on cam 16 to bias handle 13 to its normal or intermediate position.—(*Accepted June 5, 1941.*)



* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. The full specifications can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s

COMPLETE SPECIFICATIONS ACCEPTED

535,027. Superheater Co. Ltd. (Schmidtsche Heissdampf Ges.). Steam superheater elements for use in the smoke tubes of boilers.

535,109. Roe, L. B., and Roe, J. J. A. Means for ventilating and extracting foul air from the interiors of vehicles.

535,366. Resilient Products Corporation. Tie plate arrangements for railroads.

536,561. Davies, W. N. Device for indicating the opening of the doors of vehicles.

536,609. Dell, R., London Passenger Transport Board, and Every, W. S. Method of operating power signalling for railways and the like.

536,660. Thornycroft & Co. Ltd., J. I., and Villar, G. Water-tube boilers.

536,853. Westinghouse Electric International Company. Current collectors for electric vehicles.

Argentine Railway Results

Results for the six months July-December of the financial year 1941-42

According to the returns issued by the *Instituto de Estudios Económicos del Transporte*, the global receipts of the combined State and privately-owned railways during the first six months of the current financial year show an improvement over those of the corresponding period of 1940-41. This applies particularly to the four broad-gauge companies, which show substantially higher revenues under all heads. The aggregate gross earnings of all the lines during the half-year under review amounted to, approximately, 255,835,000 pesos, an increase of 37,915,000 pesos, or 17·4 per cent.

WORKING RESULTS FOR THE SIX MONTHS JULY—DECEMBER, 1941-42, COMPARED WITH THOSE FOR THE CORRESPONDING PERIOD OF 1940-41

	First six months 1940-41	First six months 1941-42	Inc. or dec.	Percentage
Goods—				
Tons ...	18,680,000	23,063,000	+4,283,000	+23·5
Ton-km.	6,251,566,000	7,504,459,000	+1,252,893,000	+20·0
Passengers—				
Number	83,051,000	86,422,000	+3,371,000	+4·1
Pass.-km.	2,274,475,000	2,385,341,000	+110,866,000	+4·9
Receipts (pesos)—				
Goods ...	151,201,000	184,906,000	+33,705,000	+22·3
Passengers	44,665,000	46,906,000	+2,241,000	+5·0
Miscellaneous	22,054,000	24,023,000	+1,969,000	+8·9
Total receipts (paper pesos)	217,920,000	255,835,000	+37,915,000	+17·4

GROSS RECEIPTS FOR THE SIX MONTHS JULY—DECEMBER, 1941-42, COMPARED WITH THOSE FOR THE CORRESPONDING PERIOD OF 1940-41

	First six months 1940-41	First six months 1941-42	Inc. or dec. (paper)	Percentage
B.A.G.S. and subsidiary lines	51,946,751	60,119,836	+8,173,085	+15·7
Central Argentine	39,569,331	49,430,549	+9,861,218	+24·9
B.A. & Pacific	31,082,564	34,942,311	+3,859,747	+12·4
B.A. Western	18,214,402	22,669,841	+4,455,439	+24·5
Entre Rios	6,209,340	7,525,115	+1,315,775	+21·2
N.E. Argentine	4,382,984	5,156,624	+773,640	+17·7
Total receipts of British-owned companies	151,405,372	179,844,276	+28,438,904	+18·8
Santa Fé Prov.	5,865,568	7,829,721	+1,964,153	+33·5
Compañia General	4,156,678	5,440,813	+1,284,035	+30·9
C. Buenos Aires	2,282,316	2,810,878	+528,562	+23·2
R.P. Belgrano	1,292,600	1,996,804	+704,204	+54·5
Total receipts of private companies	165,002,534	197,922,393	+32,919,858	+20·0
State Railways	52,917,263	57,912,581	+4,995,318	+9·4
Grand total for all railways	217,919,797	255,834,973	+37,915,176	+17·4

(Figures for the financial year 1940-41 were published in our April 24 issue, at page 513.)

The aggregate goods tonnage carried amounted to 23,063,000, an increase of 4,383,000, or 23·5 per cent.; on the tons-km. basis there was an increase of nearly 1,253 millions, or 20 per cent. The gross receipts amounted to 184,905,000 pesos, an increase of 33,705,257 pesos, or 22·3 per cent. The notable increase in goods traffic registered by all the lines is due mainly to the heavier grain movement during the period under review; the aggregate increased tonnage for all the privately-owned railways was 28 per cent., and, for the State railways, 8·9 per cent. Of the four broad-gauge lines, the company with the greatest improvement under this head was the Central Argentine, which had an increase of 37·4 per cent., closely followed by the B.A.W.R. with 32·7 per cent.; the increases registered by the B.A.G.S.R. and the B.A.P.R. were 16·8 and 13·6 per cent., respectively. Goods revenues on all railways were proportionately higher, and the broad-gauge line which had the best results was again the C.A.R., with an increase of over 9,000,000 pesos, or 38·7 per cent. Earnings on the B.A.W.R. rose by 32·4 per cent., on the B.A.G.S.R. by 21·9 per cent., and on the B.A.P.R. by 14·6 per cent.

The total number of passengers was 86,422,000, an increase of 3,371,000, or 4·1 per cent.; the receipts under this head amounted to 46,905,000 pesos, an increase of 2,240,716 pesos, or 5 per cent. An increase in the number of passengers was recorded by all the British-owned lines except the Entre Rios, which showed a decline of 30,000, or 9·7 per cent.; the B.A.G.S.R. carried the most passengers, and attained a figure of 29,659,000, an increase of 2·6 per cent. The greatest increase was shown by the C.A.R., which transported 1,144,000 passengers, or 4·3 per cent. more than in the corresponding period of 1940. The highest percentage increase was recorded by the N.E. Argentine (13 per cent.); the State railways, which recorded an 8·4 per cent. increase, were next in order. The increase in passenger earnings on the B.A.G.S.R. and the B.A.W.R. was almost identical—547,544 pesos and 547,796 pesos, respectively; but the percentage increase on the former was 4·1 per cent., and that on the latter was equivalent to 11·2 per cent. The increase on the C.A.R. was 4·2 per cent., and on the B.A.P.R. 5·6 per cent. Passenger receipts on the State lines were 7·4 per cent. higher.

Miscellaneous earnings were higher by 1,969,246 pesos, or 8·9 per cent., than in the previous corresponding period.

Swedish Privately-Owned Railways in 1941

The privately-owned railways in Sweden returned in 1941 an aggregate income of Kr. 150,000,000, an increase of about 13 per cent. over the 1940 figure of Kr. 132,600,000. This is partly accounted for by the 10 per cent. increase in rates and fares introduced in July, 1940. Passenger receipts rose by Kr. 7,100,000, or 17 per cent., to Kr. 49,000,000, and goods receipts by Kr. 9,700,000, or about 10½ per cent., to Kr. 93,200,000. Expenditure rose also, from Kr. 99,300,000 in 1940 to Kr. 116,500,000 in 1941, an increase of more than 17 per cent., and the working surplus for 1941 amounted to Kr. 33,500,000. This figure is slightly higher than that for 1940, which was Kr. 33,300,000. The net profit was Kr. 10,100,000, about 15 per cent. less than in 1940, after allocations had been made to the renewal fund (Kr. 10,400,000), to interest service (Kr. 5,100,000), to taxation (Kr. 7,100,000) and to other items (Kr. 800,000).

The following companies' results showed some exception to the general trend:—

Trafik Aktiebolaget Grängesberg-Oxelösund

This is the transport subsidiary of Sweden's most powerful mining concern, and its railways show substantial increases in net profits for 1941. Oxelösund-Flen-Västmanlands Järnvägs Aktiebolaget, one of the railways belonging to the group, increased its net profit from Kr. 670,000 in 1940 to Kr. 1,100,000 in 1941 and paid an increased dividend for that year of 10 per cent. on the share capital of Kr. 8,000,000. Another company, Örebro-Köpings Järnvägs Aktiebolaget, showed a net profit of Kr. 420,000, compared with Kr. 370,000 in 1940, and paid a dividend of 5 per cent. on its share capital of Kr. 8,000,000, compared with 4 per cent. the year before.

Gotlands Järnvägs Aktiebolaget

This company operates the railway and bus services on Gotland Island, and its net profit for 1941 amounted to Kr. 78,000, compared with Kr. 72,000 for 1940. A dividend of 5 per cent. was paid for last year, against 4 per cent. for the year before. Working receipts from the railways were Kr. 1,280,000, an increase over the previous year of Kr. 110,000, and working expenditure rose by Kr. 130,000 to Kr. 1,100,000. Road working receipts increased by Kr. 50,000 to Kr. 280,000, working expenditure was Kr. 250,000, or Kr. 40,000 above that of 1940.

Halmstad-Nässjö Järnvägs Aktiebolaget

The company's report for 1941 states that, while passenger traffic showed a considerable increase, there was a decline in goods traffic due to the closing down of most of the wood pulp and paper works in the area served by the railway. This loss was partially, but not sufficiently, offset by a certain increase in traffic due to the fact that wood formerly used for pulp production is now being turned over increasingly to use as firewood. Total receipts were Kr. 8,260,000, as compared with Kr. 7,980,000 in 1940. Goods traffic accounted for Kr. 4,670,000 (against Kr. 4,800,000 in 1940), passenger traffic for Kr. 1,960,000 (Kr. 1,780,000 in 1940), and road traffic for Kr. 670,000 (Kr. 540,000 in 1940). Expenditure rose considerably, and taxation increased to Kr. 400,000, against the 1940 figure of Kr. 330,000. An allocation of Kr. 680,000 (against Kr. 500,000 in 1940) was made to the renewal fund, and a dividend of 7 per cent. was paid. The company's system, plants, and road motor vehicles were valued at Kr. 11,900,000, as opposed to Kr. 12,370,000 the year before.

Bergslagen Railway Group

The Bergslagen Railways comprise the largest privately-owned railway system in Sweden, and, under Trafikförvaltningen Göteborg-Dalarna-Gävle (Traffic Group GDG), the following railways are operated as one with the Bergslagen Company; Gavle-Dala Järnvägs Aktiebolaget, and Södra Dalarnes Järnvägs Aktiebolaget. The Bergslagen Railways returned an income for 1941 of Kr. 8,500,000, against Kr. 7,940,000 for 1940, of which the share in the Traffic Group GDG accounted for Kr. 6,060,000, an increase of Kr. 130,000 over the 1940 figure. The net profit rose from Kr. 2,310,000 in 1940 to Kr. 2,320,000 in 1941, and a dividend of 5 per cent. was paid. Gävle-Dala Järnvägs Aktiebolaget recorded an income of Kr. 3,360,000 in 1941, compared with Kr. 3,290,000 in 1940, and the share in the Traffic Group GDG accounted for Kr. 2,510,000 of this, as opposed to

Kr. 2,470,000 in 1940. Net profit rose from Kr. 1,420,000 to Kr. 1,530,000, and a dividend of 7 per cent. was paid.

Trafikförvaltningen Göteborg-Dalarna-Gävle returned working receipts amounting to Kr. 43,070,000, compared with Kr. 37,500,000 for 1940, and other receipts aggregated Kr. 500,000, and Kr. 390,000, respectively; combined receipts were thus Kr. 43,570,000 for 1941. Working expenditure was Kr. 31,840,000 (Kr. 26,780,000 in 1940) and, after the usual allocations had been provided for, a surplus of Kr. 9,260,000 remained at the company's disposal. Goods traffic increased by 10·5 per cent. over that of 1940, and goods receipts by 12·3 per cent. The group serves mainly industrial regions, so that a heavy tonnage is normally handled in any case, and the 10 per cent. increase in rates already referred to has played a considerable part in the rise in goods receipts. The three road transport companies owned by the traffic group were combined in 1941, and the resultant concern showed working receipts of Kr. 6,090,000, against the three companies' aggregate of Kr. 4,450,000 in 1940.

Permanent Way Institution

The annual summer general meeting of the Permanent Way Institution was held at the Charing Cross Station Hotel, London, W.C., on Saturday, July 4, with the President, Mr. F. E. Harrison, O.B.E., in the Chair. A fair number of members attended; ten sections were represented, including Scotland, Manchester, South Wales, Nottingham, and Exeter. Before commencing the business of the meeting, the President made sympathetic reference to the death of Mr. John Miller, President of the institution during the years 1920-21.

The Secretary (Mr. H. Janes) reported that during the first half-year of 1942 there had been a decided improvement in section activities and meetings were now being held by eleven home sections. During the past six months 194 members had been elected, and in this number seventeen different sections were represented; 89 of these applicants were from India, and from home railways the figures were: L.M.S.R., 59; L.N.E.R., 23; S.R., 8; G.W.R., 3; L.P.T.B., 2. This steady influx of new members during the present stressful time was an encouraging augury for the future, and when normal times returned it was hoped that the activities of the institution would not only revert to their pre-war standard, but increase.

The first *Journal* of the year, the April issue, had been published, but drastic restriction in paper supply had made it necessary to remodel the layout. By the use of smaller type throughout the quantity of letterpress was little reduced, although the size of the *Journal* had been materially lessened. The revised arrangement was a wartime measure only, and as soon as conditions permitted the *Journal* would be published in the standard style.

The Treasurer (Mr. F. Lawson) gave particulars of the finances, and reported that the cash balance stood at the satisfactory figure of £2,668 compared with £2,582 a year ago. The council had that morning decided to purchase a further £200 worth of 3 per cent. Defence Bonds which would increase the institution's investments to over £2,000.

Mr. Harrison, commenting on the reports, said that he regretted they were unable to have gathered at one of the usual summer conventions but circumstances precluded this, and therefore they had met quietly in London to transact formal business. He stressed the importance of holding meetings of sections; it was notable that the larger number of new entrants to the institution were recruited from areas where section meetings and visits were more or less regular. The question of arrears of subscriptions was a vexed one, but he was not unduly concerned. His feeling about the institution at the present time was reflected in the last paragraph of the excellent report submitted by the Secretary and Treasurer jointly, which read as follows: "To have weathered the stress of war up to the present and have a good reserve in hand augurs well for the future and it can confidently be hoped that as soon as normal activities are possible the Permanent Way Institution will be able to go forward in confidence and strength, continuing in post-war years that rate of progress which had become most evident in the years immediately preceding the war. If one and all have this object in view there will be little doubt as to the ultimate result."

The statement of accounts and balance sheet for the year 1941 was then submitted for approval, and after various items had been explained by the Treasurer it was unanimously accepted.

It was decided that the Winter General Meeting should take place on Saturday, January 30, 1943, and the meeting closed with a vote of thanks to Mr. Harrison for presiding.

Questions in Parliament

Below are summarised Answers to Questions in Parliament affecting transport. The Minister concerned and the date of the Answer are given in parentheses

Petrol Allowances

Where, owing to the absence of adequate alternative transport an applicant is obliged for the purposes of his business or profession to drive to the local railway station, the Divisional Petroleum Officer has discretion to grant a suitable allowance.—(Mr. Geoffrey Lloyd, Joint Parliamentary Secretary, Ministry of Fuel & Power, June 24.)

Bus Stops

I regret that I cannot adopt the suggestion to allow Green Line motorbuses of the London Passenger Transport Board to wait in Cavendish Square, W.1, more than four minutes when necessary. Green Line buses used to wait more than four minutes in the Square, but serious congestion resulted, and the police authorities lodged complaints, which the Regional Transport Commissioner could not ignore.—(Mr. P. J. Noel-Baker, Joint Parliamentary Secretary to the Ministry of War Transport, June 24.)

Mr. T. Levy (Elland—C.) said that the buses had now to be driven into Portland Place to wait, and return to the terminus in Cavendish Square, a round journey of nearly a mile, involving unnecessary consumption of about 30 gal. of petrol a week.

Producer-Gas Plant

The design of producer chosen for public service vehicles has been successfully operated for a considerable time by one of the largest bus interests in the country. The design chosen for goods vehicles has been subjected to intensive tests under the supervision of a committee of experts. Experience will doubtless suggest improvements, but immediate action is now required, and for that reason I cannot accept the suggestion that there should be further consultations before manufacture is begun. Mr. W. J. Brown (Rugby—Ind.) may, however, be assured that the closest touch is being maintained with road transport interests. The Minister of War Transport will bear in mind the skill and resources of all manufacturers of producer-gas plants. But Mr. Brown will appreciate that many factors must be borne in mind, including the advantages of mass-production, and the lower cost and faster output which that will give.—(Mr. P. J. Noel-Baker, June 25.)

Petrol Distribution

Local taxation offices are not offices of the Ministry of Fuel & Power, but, by arrangement with the Minister of War Transport and the local authorities concerned, they are (like Post Offices) enabled to issue certain forms and documents. I am not aware of any complaint on their behalf as to lack of the information necessary for that work. Inquiries such as those regarding the changes in the distribution of petrol for the use of motorcars should be addressed to the Divisional Petroleum Officer.—(Major G. Lloyd George, Minister of Fuel & Power, June 25.)

Grass on Railway Sidings

After consultation with the railway authorities, farmers have been advised that, as in previous years, they should apply to the local stationmaster for permission to harvest grass on railway embankments for hay or silage or bedding. I hope that full advantage will be taken of these facilities. The railway companies themselves harvest the grass from certain stretches of line for feeding to their own horses, but shortage of suitable labour and the exigencies of operational requirements necessarily limit what they can do. Grass which is not harvested must be burned off to minimise the risk of fire and to prevent seeds being blown on to the tracks.—(Mr. R. S. Hudson, Minister of Agriculture, June 25.)

Public Service Vehicles

Buses and coaches are already subject to a general maximum speed of 30 miles an hour, or 20 miles an hour in built-up areas during black-out hours. The time schedules of bus and coach services are carefully regulated by the Regional Transport Commissioners from the point of view of speed in relation to conditions on the route. For these reasons it is not considered that a general review of the schedules of public service vehicles so as to permit a longer time for journeys is necessary. (Captain J. H. F. McEwen, Lord of the Treasury, on behalf of Mr. P. J. Noel-Baker, Joint Parliamentary Secretary to the Ministry of War Transport, July 1.)

Sale of Commercial Vehicles

The sale of new commercial vehicles and certain ex-Government vehicles is already subject to a system of control administered by the Ministry of War Transport. The question of extending this control to second-hand goods vehicles generally will be considered in the light of the Report of the Panel of Investigators. (Captain J. H. F. McEwen on behalf of Mr. P. J. Noel-Baker, July 1.)

Prices of Second-Hand Motors

The Minister of War Transport has appointed a Panel of Investigators to inquire into the prices of second-hand motor vehicles. Their terms of reference are as follow: "To consider how far the general level of prices of second-hand motor vehicles, or second-hand motor vehicles in any particular category, is above the level of prices prevailing for similar motor vehicles immediately before the war; to

what extent any increases in these levels are in general justifiable; and to what extent such increases, if any, are leading to undesirable results." The Panel of Investigators is composed of the following four consulting engineers: Messrs. William D. Duncan Connall, H. V. Stephenson, W. Jardine, and J. G. Dainty. The panel has already held preliminary meetings and has begun its investigations. It has been asked to report as soon as possible. (Captain J. H. F. McEwen on behalf of Mr. P. J. Noel-Baker. July 1.)

Severn Bridge Scheme

A Bill for the construction of a bridge at English Stones was introduced in the House in 1935. It embodied financial proposals which were acceptable both to the Treasury and to the Local Authorities concerned. It was, however, rejected in Committee. The Parliamentary Secretary to the Ministry of War Transport would be glad to consider any similar or new proposals for the crossing of the River Severn which may be submitted by the appropriate Highway Authorities. It would not be practicable to begin construction on any such scheme during the war. (Captain J. H. F. McEwen on behalf of Mr. P. J. Noel-Baker. July 1.)

Coach Services

Notification to the public of alterations in road passenger services is made by the operators concerned. Where the Regional Transport Commissioners find it necessary to impose reductions, they endeavour to allow reasonable time for notification. It is not yet possible to say what the position will be next winter. The cost of necessary travel will, of course, be taken into account, but the saving of fuel and tyres must henceforth be the dominant consideration. (Captain J. H. F. McEwen on behalf of Mr. P. J. Noel-Baker, July 1.)

Parliamentary Notes

L.P.T.B. Bill

The London Passenger Transport Board Bill was reported, without amendment, to the House of Lords on June 30. It was read the Third time and passed on July 1.

Staff and Labour Matters

Railway Wages

Representatives of the Railway Executive Committee met representatives of the National Union of Railwaymen and the Railway Clerks' Association on Friday, July 3, when the trade unions presented their claims for increased wages. The National Union of Railwaymen is claiming an increase of 10s. a week for wages staff and £26 a year for salaried staff, and the Railway Clerks' Association is claiming an increase of £26 a year for salaried staff.

Civil Servants' War Bonus

Increases ranging from 1s. to 3s. 6d. a week have been granted to non-industrial Civil Servants as from June 1, 1942. The increases are as follow:—

Men:—	
With salaries up to £250	3s. 6d. a week, making the total bonus 13s. 6d.
With salaries above £250 up to £500	2s. 6d. a week, making the total bonus 7s. 6d.
Women:—	
With salaries up to £250	2s. 6d. a week, making the total bonus 10s.
With salaries above £250 up to £500	2s. a week, making the total bonus 6s.
Boys and girls:—	
Under 18 years of age ...	1s. a week, making the total bonus 4s.
18 to 21 years of age ...	1s. 6d. a week, making the total bonus 6s. 6d.

Notes and News

Paraguay Central Railway Co. Ltd.—Payment is announced of the half-yearly interest on the 6 per cent. prior lien debenture stock at 3 per cent. actual, less tax.

U.S.A.-Peru Trade Pact.—A trade agreement between the U.S.A. and Peru, which was signed on May 7 last, is to come into force on July 29.

Chilean Railway Accident.—Two railwaymen were killed recently when a railway wagon laden with 100 bags of powder from the San Donato nitrate plant exploded in course of transit, according to a press message from Iquique, Northern Chile.

W. & T. Avery Limited.—In the statement for the year to March 31, 1942, the net profit is given as £130,407, against £130,661. The final dividend proposed on the ordinary capital is again 10 per cent., making 15 per cent. for the year (same).

C.N.R. Accident near Arola, B.C.—It is reported that one passenger was killed, and 41 injured, in an accident which took place, on May 28 last, near Arola, B.C., Canadian National Railways. An eastbound passenger train collided with the rear of a passenger train which was being run extra to the ordinary services, and which had stopped at Arola to take in water.

Tillings Association.—The registration of Tillings Association Limited as a company limited by guarantee, without share capital, took place on June 5. Some details of the organisation were given at page 708 of our June 26 issue. The secretary is Robert Prentice, and the registered office is at Bovingdon Grange, Bovingdon, Herts.

The New Tilling & B.A.T. Companies.—The two new companies envisaged by the scheme for the segregation of the assets of Tilling & British Automobile Traction Limited were registered as public companies on June 26, each with a nominal capital of £100 in 100 10 per cent. cumulative preference and 100 ordinary shares of 10s. each. One company is named the Tilling Motor Services Limited, and the other B.E.T. Omnibus Services Limited. The impending formation of these companies, and some details of the segregation arrangements were given in our issue of June 26 at pages 691 and 708.

Butterley Co. Ltd.—Net profit for the year to March 31, 1942, was £102,848, against £93,832, to which is added £60,411 brought forward. A sum of £10,000 is transferred to reserve. Dividend on the ordinary capital is 7½ per cent. (same), and the amount carried forward is £63,259.

Robert Stephenson & Hawthorns Limited.—For the year 1941 the net profit, after charging depreciation and reserves for contingencies and taxation, was £17,853 (£18,668). A sum of £5,000 (same) is allocated to reserve. The dividend for the year is maintained at 5 per cent., and the carry forward is £4,014 (£4,912). During the year the works were very fully employed.

Great Southern Railways (Eire).—For the 25th week of 1942 the Great Southern Railways (Eire) report passenger receipts of £40,575 (against £44,269), and goods receipts of £55,589 (against £49,558), making a total of £96,164 (against £93,827), for the corresponding period of the previous year. The aggregate receipts to date are passenger, £827,759 (against £920,144), goods, £1,484,862 (against £1,252,106), making a total of £2,312,621 (against £2,172,250).

Sunderland Transport Dispute.—A settlement was reached on June 20 of the dispute between the transport committee of the Sunderland Corporation and its employees, who had refused to work a service required to be extended by 30 minutes to 11 p.m. on Saturdays during the summer. As the result of a conference at the headquarters at Newcastle of the North Regional Transport Commissioner, the employees' representatives agreed that the extension should be worked as from

Mr. E. J. Missenden, General Manager, Southern Railway (right) with the Welfare Officer, despatching a consignment of personal parcels for staff of the "Southern" who are prisoners of war

OFFICIAL NOTICES

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

MAINTENANCE ENGINEER required for the Trinidad Government Railway for three years, with possibility of permanency. Salary $.T.2880 rising to $.T.3840 a year ($.T.4·80 = £1). Free passages. Candidates must be A.M.Inst.C.E. or hold equivalent qualifications; have been thoroughly trained in theoretical and practical engineering on a British Railway; and be capable of taking charge of permanent way, works and signalling equipment, and the supervision and preparation of plans, estimates, accounts, reports, etc. Write for application forms to The Central Register C.1054, Ministry of Labour and National Service, Kingsway, London, W.C.2.

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June 27. Further difficulties arose, which have now been overcome.

W. T. Henley's Telegraph Works Co. Ltd.—After providing for taxation and general charges the net profits for 1941 were £326,380 (£320,565) to which must be added £382,397 brought in. A transfer is again made of £50,000 to war contingencies account, and the final ordinary dividend of 10 per cent., together with a cash bonus of 5 per cent., brings the total distribution for the year to 20 per cent. (same), leaving £381,276 to be carried forward.

Canadian Pacific Railway.—Gross earnings for May, 1942, were $21,522,000, an increase of $2,245,000, and expenses were $17,288,000, or $2,193,000 higher. Net earnings at $4,234,000 were $52,000 more than for May, 1941. For the first five months of 1942 gross earnings amounted to $99,788,000, an increase of $18,444,000, and the net earnings of $17,744,000 were $1,923,000 greater than for the first five months of 1941.

Algoma Central & Hudson Bay Railway Company.—Gross receipts in 1941 amounted to $3,798,782, compared with $2,729,849 in the previous year. Working expenses rose from $2,423,809 to $2,986,098, leaving balance of $812,684. After payment of terminal rental and bond interest, the net profit was $42,241. The bondholders' committee reported that £50,675 sterling of Algoma terminal bonds were purchased and cancelled.

Railway Convalescent Homes.—The income and expenditure account of the Railway Convalescent Homes for the year ended December 31, 1941, shows an income of £47,557, and expenditure (including depreciation) £34,817, leaving a balance of £12,740. The income was made up of £40,260 from railway staff collections, £575 from donations from the public, etc. £3,446 from investments, £2,399 from hospital and war department services, and £877 from sundries. Expenditure on maintenance was £29,147 and on administration £4,237. The number of patients using the homes in 1941 was 2,601, including 2,150 men, 431 women, and 20 babies.

Glasgow Corporation Transport Services.—A record traffic revenue of £4,264,219 was earned by the Glasgow Corporation Transport Services—tramway, bus, and underground—in the year to May 31, 1942; the net surplus of £268,532 was also a record. From the tramways the surplus was £283,970, and the underground surplus of £21,742 was the first surplus earned since the railway was acquired by the Corporation in 1923. On the bus services there was a deficit of £37,180, attributable largely to the high proportion of special services which the corporation had to operate in connection with the national effort. The transport undertaking now has assets to the value of £10,379,245, entirely free of debt.

Bulgarian Transport Credits.—It has been reported that a Bill has been introduced in Bulgaria whereby the Bulgarian Ministry of Transport will be granted a credit of 3,520,000,000 leva. Of this sum, 2,828,000,000 leva is to be allocated to railway material; 692,000,000 leva for the development of shipping; and 650,000,000 for the construction of roads. The road construction will be undertaken by the Ministry of Works, according to a German news agency message from Sofia.

Unification of Railways.—Mr. F. J. Burrows, President of the National Union of Railwaymen, at the annual conference at Blackpool on July 6 said that plans for the unification of the railways were already well under way and that they envisaged either public ownership or a form of controlled industry similar to that of the London Passenger Transport Board. Saying that the workers would then be called on to face a united railway board, he urged the three railway trade unions to form a united body.

London Transport Extension of Time Order.—The Minister of War Transport has made the London Passenger Transport Board (Extension of Time) Order, 1942 (S.R. & O., 1942, No. 1140), extending by three years: (1) the time now limited by section 5 of the London Passenger Transport Act, 1937, for the commencement of the running of trolley vehicles on routes authorised by that section; (2) the time limited by section 27 of the 1937 Act for the completion of works authorised by Part III of that Act in Hendon, Harrow, Amersham, Islington, City of London, and Kensington; (3) the time limited by sections 29 and 34 of the Act of 1939 for the compulsory purchase of lands authorised to be acquired by the Act of 1936 for the construction of works at Marylebone and for the improvement of Gloucester Road station, and for the compulsory purchase of lands required for works authorised by the Act of 1939.

Contracts and Tenders

It was reported from Ankara at the end of June that a Turkish Railway Commission which has been visiting Berlin has ordered 30 locomotives and about 500 railway wagons.

The Peruvian Corporation has placed an order with Beyer, Peacock & Co. Ltd. for miscellaneous spare parts, to the inspection of Messrs. Livesey & Henderson, for the Central Railway of Peru.

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices July 3, 1942	Rise/ Fall
G.W.R.				
Cons. Ord.	43⅜	30⅜	44	– ½
5% Con. Pref. ...	109½	83½	106½	– ½
5% Red. Pref. (1950)	105½	96½	106	—
4% Deb.	113½	102½	107§	—
4½% Deb.	115	105½	108½§	– 1
4½% Deb.	121½	112	114½§	– 2
5% Deb.	132	122	127½§	– 1
2½% Deb.	70	62½	72½§	– 2
5% Rt. Charge ...	129½	116	124½§	– 3
5% Cons. Guar. ...	128	110½	123	– ½
L.M.S.R.				
Ord.	17½	11	19½	—
4% Pref. (1923) ...	53	33½	52½	– ½
4% Pref.	68½	48½	68½	– ½
5% Red. Pref. (1955)	97½	77	99½	—
4% Deb.	105½	97	102	—
5% Red. Deb. (1952)	110½	106½	109½	—
4% Guar.	100	85½	98½	– ½
L.N.E.R.				
5% Pref. Ord. ...	3½	2½	3½	—
Def. Ord.	2	1½	1½	—
4% First Pref. ...	52½	33	51½	– ½
4% Second Pref. ...	19½	10	21	– ½
5% Red. Pref. (1955)	79½	52	88	—
4% First Guar. ...	90½	74½	93	—
4% Second Guar. ...	80½	59	82½	– ½
3% Deb.	79½	68½	77½	– ½
4% Deb.	104	91½	101½	—
5% Red. Deb. (1947)	106	102½	104½	—
4½% Sinking Fund Red. Deb.	103½	99 11/16	103½	—
SOUTHERN				
Pref. Ord.	65½	43½	62½	– ½
Def. Ord.	15½	9	16	– ½
5% Pref.	107	77½	106	—
5% Red. Pref. (1964)	107	89½	108½	—
5% Guar. Pref. ...	128	111	122	– 2½
5% Red. Guar. Pref. (1957)	114½	107½	111½	—
4% Deb.	112	102½	105½	—
5% Deb.	130½	119	127½	—
4% Red. Deb. (1962–67)	108½	102	108½	—
4% Red. Deb. (1970–80)	108½	102½	107½	– 1
FORTH BRIDGE				
4% Deb.	99½	90½	107	—
4% Guar.	99	85½	103½	—
L.P.T.B.				
4½% "A"	120 11/16	109½	112½	– 1
5% "A"	130½	115½	124½	—
4½% "T.F.A." ...	103½	99½	100	—
5% "B"	117	102	112½	—
"C"	46½	28½	41	—
MERSEY				
Ord.	24½	19½	22	—
4% Perp. Deb. ...	100	90	100	—
3% Perp. Deb. ...	73½	63	78	—
3% Perp. Pref. ...	58	51½	58	—
IRELAND				
BELFAST & C.D.				
Ord.	4	4	9	—
G. NORTHERN				
Ord.	14½	3	21½	+ ½
G. SOUTHERN				
Ord.	14½	5	17½	– 2½
Pref.	17	10	17	—
Guar.	44	16	38	+ 1½
Deb.	61	42	63	+ 2

§ ex dividend

Railway Stock Market

The war news from the Middle East induced a better tendency in Stock Exchange markets earlier in the week, and aided by some improvement in the volume of business, values in most sections showed recovery. The weight of money seeking investment was reflected by continued steady demand for gilt-edged stocks and other high-class investments, but on the other hand, various home railway prior charges were again slightly lower on balance. This was perhaps due in part to the unsettling influence of the revival of vague talk of railway unification developments; but it is realised in responsible quarters that there is no question of any immediate decision as to the post-war organisation of transport, although information is probably being collected on which a transport policy for the future may be based. The financial agreement with the Government is, of course, scheduled to run for one year after the war, and meanwhile, the dividend prospects of the junior stocks are fairly clearly defined, and distributions are likely to remain around the same rates paid for 1941. Because of the rental agreement, the renewed demand for increased wages accompanied by a threat of a strike, has no influence on dividend prospects. The question of eventual unification of transport may, of course, raise that of the long-term investment merits of railway prior charges, but in any important post-war development of this kind, it can, of course, be assumed that stockholders will receive fair and equitable treatment, and these securities continue to rank among first class investments. Whereas some of the prior charges were again slightly lower on balance, there has been a strong rally in the junior issues. The latter reflects an increase in speculative activity, awaiting the interim dividend decisions, due later in the month. The market remains hopeful that on this occasion it may be decided to make interim payments on both L.M.S.R. ordinary and on L.N.E.R. second preference, but there are less hopeful views as to the possibility of an interim on Southern deferred; doubts are expressed as to whether payment of an interim distribution is permitted on this stock. Meanwhile the yield on the latter still exceeds 10 per cent., and yields of over this rate are also shown by L.M.S.R. ordinary and by L.N.E.R. second preference.

Great Western ordinary has rallied strongly to 45½, which compares with 44¼ a week ago; the guaranteed stock at 123 was unchanged on balance, but the 4 per cent. debentures were fractionally lower at 106, as was the 5 per cent. preference at 106½. Whereas L.M.S.R. ordinary moved up from 19⅛ to 19⅞, the 1923 preference and senior preference at 53 and 69 respectively, were unchanged on balance. The 1923 preference yields 7½ per cent., and in common with L.N.E.R. first preference and Southern preferred, would seem to be moderately valued. L.M.S.R. guaranteed moved back slightly to 98½, but the 4 per cent. debentures showed a small gain to 102½. L.N.E.R. second preference rose on balance from 21¾ to 22½, due to hopes of an interim payment; there is also talk in this case of the possibility of a slightly higher total payment for the year. Revival of speculative interest in railway stocks was reflected by small gains in L.N.E.R. preferred and deferred. This railway's first preference, after moving back to 51½, rallied to 52 and was unchanged on balance. L.N.E.R. second guaranteed, however, at 82½ has lost half-a-point at the time of writing, as has the first guaranteed at 92½. Southern deferred was 16⅞, compared with 16½ a week ago, and the preferred 64, compared with 63½. Southern preference was 106, the guaranteed 123, and the 4 per cent. debentures 105½. London Transport "C" has remained at 40½ at the time of writing.

Argentine and other foreign railway stocks moved better in accordance with the surrounding market tendency. In some cases debenture stocks continued to be in short supply. Argentine Great Western 5 per cent. debentures rose to 47, and B.A. Gt. Southern 4 per cents to 56. Leopoldina debentures were better, as were San Paulo ordinary, Antofagasta preference and United of Havana debentures. Canadian Pacific showed fractional improvement.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open 1941-42	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1941	No. of Weeks	Aggregate Traffics to date: Totals: This Year	Aggregate Traffics to date: Totals: Last Year	Aggregate Traffics to date: Increase or Decrease	Shares or Stock	Prices: Highest 1941	Prices: Lowest 1941	Prices: July 3, 1942	Yield% (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	28.6.42	22,710	— 1,800	26	550,880	468,540	+ 82,340	Ord. Stk.	10¾	3¹¹/₁₆	8¼	Nil
	Argentine North Eastern	753	27.6.42	ps. 227,900	+ ps. 44,600	52	ps. 9,565,700	ps. 7,603,100	+ ps.1,962,600	,,	4	1	4¼	Nil
	Bolivar	174	May, 1942	4,605	+ 405	21	23,063	19,132	+ 3,931	6 p.c. Deb.	5	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds	8	2⅛	13	Nil
	Buenos Ayres & Pacific	2,801	27.6.42	ps. 1,035,000	— ps.550,000	52	ps. 75,816,000	ps. 75,233,000	+ ps.583,000	Ord. Stk.	7⅛	1½	4¼	Nil
	Buenos Ayres Great Southern	5,080	27.6.42	ps. 2,063,000	— ps.496,000	52	ps.125,941,000	ps.115,881,000	+ ps.10,060,000	Ord. Stk.	10¼	3½	7⅞	Nil
	Buenos Ayres Western	1,930	27.6.42	ps. 1,008,000	+ ps. 58,000	52	ps. 45,230,000	ps.41,538,000	+ ps.3,692,000	,,	9	2½	6½	Nil
	Central Argentine	3,700	27.6.42	ps. 2,003,750	+ ps. 80,150	52	ps. 91,897,700	ps.85,989,500	+ ps.5,908,200	,,	8¼	2⅛	5¼	Nil
	Do	—	—	—	—	—	—	—	—	Dfd.	2½	½	3¼	Nil
	Cent. Uruguay of M. Video	972	27.6.42	18,475	— 10,249	52	1,334,359	1,237,427	+ 96,932	Ord. Stk.	9½	1	4¼	Nil
	Costa Rica	262	May, 1942	15,651	— 3,810	46	228,220	218,358	+ 9,862	Stk.	15½	11½	13	Nil
	Dorada	70	May, 1942	15,882	— 2,982	21	63,546	62,100	1,446	1 Mt. Db.	97	97	88¼	6¾
	Entre Rios	808	27.6.42	ps. 289,800	+ ps. 6,900	52	ps. 13,567,600	ps.11,180,500	+ ps 2,387,100	Ord. Stk.	6½	½	5½	Nil
	Great Western of Brazil	1,030	27.6.42	9,100	+ 1,300	26	256,700	243,700	+ 13,000	Ord. Sh.	11/	1/-	¾	Nil
	International of Cl. Amer.	794	Apr.,1942	$100,091	— $36,249	16	$613,915	$429,516	+ $184,399	—	—	—	—	—
	Interoceanic of Mexico	—	—	—	—	—	—	—	—	1st Pref	¾	6d.	½	Nil
	La Guaira & Caracas	22¾	May,1942	5,965	+ 730	21	32,133	30,145	+ 1,988	—	—	—	—	—
	Leopoldina	1,918	20.6.42	30,515	+ 4,377	25	727,616	586,959	+ 140,657	Ord. Stk.	4	¾	4¼	Nil
	Mexican	483	21.6.42	ps. 300,400	— ps. 8,100	25	ps. 8,325,700	ps. 7,788,000	+ ps. 537,700	,,	⅜	¼	⅜	Nil
	Midland of Uruguay	319	Apr.,1942	13,856	+ 1,640	41	136,984	120,202	+ 16,782	—	—	—	—	—
	Nitrate	386	30.6.42	13,004	+ 6,302	25	84,628	53,710	+ 30,918	Ord. Sh.	66⅜	1¹¹/₁₆	3⅜	3¹⁵/₁₆
	Paraguay Central	274	27.6.42	$4,213,000	+ $1,092,000	52	$185,424,000	$174,059,000	+ $11,365,000	Pr. Lt. Stk.	43/-	29	42½§	14½
	Peruvian Corporation	1,059	May, 1942	81,005	+ 17,967	47	833,448	709,504	+ 123,944	Pref.	6½	1¹³/₁₆	11½	Nil
	Salvador	100	Apr., 1942	c 71,000	+ c 5,000	41	c 853,172	c 683,683	+ c 169,489	—	—	—	—	—
	San Paulo	153½	21.6.42	35,744	— 10,718	25	879,837	927,042	— 47,205	Ord. Stk.	52	24½	50	4
	Taltal	160	May,1942	5,490	+ 2,395	23	49,710	30,545	+ 19,165	Ord. Sh.	1	6/-	1⅛	Nil
	United of Havana	1,346	27.6.42	41,313	+ 16,979	52	1,687,507	1,258,115	+ 429,392	Ord. Stk.	2½	⅛	3	Nil
	Uruguay Northern	73	Apr.,1942	980	— 41	41	12,070	11,329	+ 741	—	—	—	—	—
Canada	Canadian National	23,562	21.6.42	1,438,400	+ 236,800	25	31,811,400	26,774,400	+ 5,037,000	—	—	—	—	—
	Canadian Pacific	17,139	21.6.42	963,600	+ 122,800	25	22,791,600	18,786,200	+ 4,005,400	Ord. Stk.	13⅜	7⅛	10	Nil
India†	Barsi Light	202	Mar.,1942	15,570	— 390	52	165,217	167,280	— 2,063	—	—	—	—	—
	Bengal & North Western	2,090	May, 1942	281,550	+ 6,732	8	555,000	555,860	— 860	Ord. Stk.	345	253	348½	5⅛
	Bengal-Nagpur	3,267	10.3.42	263,175	— 127	50	9,354,150	8,504,657	+ 849,493	,,	101	95⅜	96	4⅛
	Madras & Southern Mahratta	2,939	Mar. 1942	253,125	+ 25,105	52	7,338,605	6,278,738	+ 1,059,867	,,	105⅞	101½	99	7⅛
	Rohilkund & Kumaon	571	May, 1942	58,950	— 12,488	8	119,550	140,639	— 21,089	,,	342	290	354½	4¼
	South Indian	2,402	31.3.42	190,120	+ 43,235	52	5,358,080	4,609,099	+ 748,981	,,	100	87	95	3⅛
Various	Beira	204	Apr..1942	80,224	—	30	534,115	—	—	—	—	—	—	—
	Egyptian Delta	607	10.4.42	10,185	+ 3,568	2	10,185	6,617	+ 3,568	Prf. Sh.	1½	29/-	2½	Nil
	Manila	—	—	—	—	—	—	—	—	B. Deb.	68	45	35	10
	Midland of W. Australia	277	Apr., 1942	25,627	+ 9,494	37	203,111	150,333	+ 52,778	Inc. Deb.	90½	85½	89½	6¹¹/₁₆
	Nigerian	1,900	28.2.42	97,375	+ 29,933	47	2,894,620	2,124,026	+ 770,594	—	—	—	—	—
	Rhodesia	2,442	Apr., 1942	503,217	—	30	3,382,397	—	—	—	—	—	—	—
	South Africa	13,291	2.5.42	789,828	+ 64,610	6	3,580,192	3,279,345	+ 300,847	—	—	—	—	—
	Victoria	4,774	Jan., 1942	1,301,285	+ 378,792	29	7,938,536	6,547,339	+ 80,660	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ¼ Argentine traffics are given in pesos
† Receipts are calculated @ 1s. 6d. to the rupee § ex dividend